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SUMMARY OF RECENT ABSTRACTS *

I. CHOLERA †

Epidemiology

Cholera is not now found in East Africa, but DAVIES (p. 722) recalls a monograph published in 1876 by James Christie in which he describes an East African epidemic in 1869–70 which involved Zanzibar, where the deaths were estimated at 20,000–30,000.

BISWAS (p. 1028) examined in detail the mortality rates from cholera in West Bengal during a period of 8 years, week by week, noting the rates which were too high to have occurred by chance. He recognized epidemic patches of high mortality, and noted that these were of long duration and high intensity in Calcutta, but were short and slight in Darjeeling.

It is known that in Calcutta cholera occurs in 2 forms: as an explosively epidemic disease in the middle of the hot weather, and as an insidious, unspectacular disease which may simulate innocuous gastro-enteritis throughout the rest of the year. DE *et al.* (p. 44) show that mortality rates, incidence of urinary suppression, shock and uraemia, and duration of diarrhoea were greater in the epidemic than in the inter-epidemic periods, and they discuss possible reasons for this.

In an enquiry into the social factors relating to the epidemiology of cholera in Calcutta SEAL and MATHEN (p. 298) bring out the facts that most of the infected areas were on the River Hooghly, which is heavily polluted, and the greatest incidence of the disease was in people living in grossly insanitary conditions in the poorer parts of the city.

The annual deaths from cholera in Calcutta fell abruptly after the introduction of a piped, filtered water supply in 1870, but annual epidemics of varying severity continued, with peak incidence in April. BHATTACHARJI and MAJUMDER

* The information from which this series of summaries has been compiled is given in the abstracts which have appeared in the *Tropical Diseases Bulletin*, 1959, v. 56. References to the abstracts are given under the names of the authors quoted and the pages on which the abstracts are printed.

† For previous articles on cholera in this series, see the January issues of the *Tropical Diseases Bulletin* each year since 1939.

(p. 1129) investigated a fairly severe epidemic in 1958 in which wards on the banks of the Hooghly river, or intersected by canals, were most affected. Inadequate housing, the use of crude water from street hydrants, the absence of latrines and the Hindu custom of frequent bathing in infected canals, appeared to be the important factors.

TANAMAL (p. 722) reports on 4 epidemics of paracholera due to the El Tor vibrio in Celebes, though in these the vibrio was highly pathogenic (producing a case-mortality rate of 88–90%), whereas the classical El Tor vibrio is only feebly pathogenic. The morbidity rate was low (2·2 per 10,000 inhabitants of Macassar) and there is little tendency for outbreaks to become epidemic.

NIKONOV (p. 1133) contends that the carrier state (up to 6–8 months after the disease), though comparatively rare, may be important in preserving the organism between epidemics, and may be more common than is generally believed. Injection of vibrios into the gall bladder of the rabbit indicates that they can persist for up to 7 months.

Aetiology

FELSENFELD and WATANABE (p. 157) elaborated a plating medium of blood agar, sodium lauryl sulphate, potassium tellurite, sodium chloride and sugar, which is satisfactory for the isolation of *V. cholerae*.

CHIBRIKOVA *et al.* (p. 1233) describe a method for detecting *V. cholerae* in water, which involves the use of membrane filters which after use are laid on solid differential medium and incubated for 8–9 hours. They are then treated with a fluorescing dye and examined for colonies, which can be picked off and tested with specific phage or agglutinating serum, and subjected to other tests. A final conclusion can be reached within 11–12 hours. The composition of the medium used is given.

SARKAR (p. 157) in tests of water from various sources in Calcutta found that *Escherichia coli*, *Salm. paratyphi B* and *Bact. alkaligenes* could survive in almost any water for up to 18 days, *V. cholerae* could survive in Hooghly water for 20 days, but dysentery bacilli failed to survive in any type of water.

Certain phages are useful for the identification of cholera vibrios, but are difficult to maintain; WATANABE (p. 158) shows that they can be preserved for at least 4 months if dried on filter paper disks and kept at 4°C.

DOMARADSKII *et al.* (p. 829) show that the presence of *V. cholerae* in a culture may rapidly be determined by adding a phage specific for the organism and noting a rise in phage titre and the production of plaques.

As a result of investigation of the indole and cholera red reactions, BEAM (p. 829) shows that in tests for the production of indole with reagents containing paradimethylaminobenzaldehyde the concentration of nitrates in the medium should not exceed 0·001%.

MUKERJEE (S) (p. 1130) notes that serological reactions make possible the detection of incomplete S–R dissociation of *V. cholerae*, and that since Group II cholera bacteriophages are lytic only for the smooth elements of cultures it is possible to study S–R dissociation quantitatively by measuring the optical density of cultures.

MUKHERJEE (A. M.) and NEOGY (p. 1133) found that intraperitoneal injection of 250 million *V. cholerae* into mice killed 80% in 12–18 hours, and they give an account of the changes found. MUKHERJI (A) (p. 1132) found living Ogawa

vibrios much more toxic than Inaba vibrios for rabbits and mice, toxicity being maximal after incubation for about 16 hours. In comment Bensted remarks that it is not stated how long these strains had been cultivated on artificial media, and that virulence tends to fall off fairly rapidly in laboratory cultures.

De (p. 1028) shows that bacteria-free culture filtrates of proved Inaba and Ogawa *V. cholerae*, inoculated into isolated loops of rabbit small intestine, produced blood-stained exudate and lesions of the mucous membrane. This effect was probably not due to a true exotoxin but may have been due to the O antigen, since in work by other scientists the necrotizing effect of products of the bacilli could be neutralized by an antibacterial serum.

In a study of the antigenic structure of *Vibrio cholerae* Lyles and Gardner (p. 45) observed that exposure for 1 hour to steam rendered certain rough and rho strains agglutinable by antisera to smooth strains, and *vice versa*, when previously they had been inagglutinable. Rho strains appear to lack an antigenic component present in both rough and smooth strains.

Takaishi (p. 1131) discusses studies on the cell wall of *V. cholerae*, which contains group specific and type specific antigens. Injection of cell wall material or cytoplasm into mice produced protective antibodies, but the cytoplasm was more toxic; the cell wall vaccine was very efficient.

In spite of some conflicting reports the general opinion is that *V. cholerae* does not produce haemolysin, whereas the El Tor vibrio does. Liu (p. 1131), however, has shown that in certain conditions *V. cholerae* can produce an extracellular haemolytic substance whose chemical nature is not yet known, though it differs from that produced by El Tor vibrios. The haemolysin seen in blood-agar plates of *V. cholerae* is due to *p*H, and in peptone water cultures to hypotonicity.

Chatterjee *et al.* (p. 944) could find no evidence of red cell sensitizing and haemagglutination inhibiting antigens of *V. cholerae* in the serum of cholera patients.

Clinical Findings: Treatment: Immunization

Chatterjee *et al.* (p. 944) describe the stools of a large series of cholera patients, noting that only half the patients had the classical rice-water stools. Various other infections were associated with the cholera and some of these appeared to have an adverse effect.

Serum glycoproteins, mucoproteins, phospholipids, total lipids and beta lipoproteins were found by Banerjee and Bhaduri (p. 1132) to be significantly increased in cholera, and alpha lipoproteins and total cholesterol diminished.

In experimental work on mice Khundanov *et al.* (p. 299) showed that cholera antiserum had only weak therapeutic action, but had a fairly pronounced prophylactic effect. Streptomycin and chlortetracycline had some protective action when given prophylactically at about the time of infection.

Guineapigs immunized with a combined vaccine of killed cholera and live plague vaccine were found by Korobkova *et al.* (p. 1134) to be well protected; the combined vaccine protected better than monovalent vaccine against challenge with virulent *V. cholerae*.

Charles Wilcocks

MALARIA

In this section abstracts are arranged as far as possible in the following order:—Human malaria—*epidemiology, aetiology, transmission, pathology, diagnosis, clinical findings, treatment, control;* Animal malaria—*monkeys, other animals, birds.*

SANDOSHAM, A. A. **Malariology with special reference to Malaya.**

This book was reviewed in this *Bulletin*, 1959, v. 56, 1298.

ZAHIR, A. R. & DABBAGH, H. S. **A Malaria Survey in North Western Part of Saudi Arabia.** *Bull. Endem. Dis.* Baghdad. 1959, Jan., v. 3, Nos. 1/2, 111–28, 2 maps on 2 folding pls.

The north-western area of Saudi Arabia is bordered to the west by the Red Sea, to the east by longitude 42° and to the south by the Jeddah-Mecca region. The area in which Mecca, Medina and other places associated with the Prophet are found is historically famous and, since it comprises pilgrimage routes and sojourn centres, epidemiologically important. It is also interesting as a border zone between Palearctic and Ethiopian fauna. The climate grows progressively cooler and less arid, from south to north. At the northern extreme winter frosts occur. The southern section has been subject to malaria control since 1952, but the northern part was more or less neglected until the survey trip made in 1957 and described in this paper was made. 59 localities in 8 centres were covered. Spleen and blood surveys were made primarily on school-children 5–15 years old; infants and small children were studied less extensively. The survey covered an area with a population of about 100,000: between 2,000 and 3,000 spleen or blood examinations were made.

At places near the Red Sea no autochthonous malaria was found, and no anopheles, or very scanty *Anopheles gambiae* and *A. sergenti*. At Medina malaria was hypoendemic; 54 *Plasmodium falciparum* and 13 *P. vivax* infections were found in 924 examinations. *A. sergenti* was the apparent carrier. *A. gambiae*, which had been found here before, was absent, whether this was because of the use of DDT or to the unfavourable season was not established. At Khaibar and Al Ola (580 km. north-east and 765 km. north of Jeddah respectively) malaria, mainly *P. falciparum*, was mesoendemic, with *A. sergenti* as carrier. Taima and Tabouk (847 and 1107 km. north-east of Jeddah respectively) had little or no malaria. Al Gorayat, contiguous to Jordan, had mesoendemic malaria in its oases—though very little in Nabk, its capital town—carried by *A. sergenti* and *A. superpictus*. *A. sergenti* seems to adapt itself to a wide range of breeding conditions, from open air trickles to pools in caves.

B. B. Waddy

MALDONAO-CAPRILES, J. & RAFI, S. M. **Results of Malariometric Surveys performed between 1939 and 1957 in Northern West Pakistan.** *Pakistan J. of Health.* 1958, July, v. 8, No. 2, 87–90.

Figures are given of malarial infection, by age-group, by species and stage of parasite detected and by splenomegaly, collected intermittently in 11 years between 1939 and 1957 in West Pakistan. Some 15,000 blood films and 12,000 spleen palpations form the data. Both parasite and spleen rates showed a

progressive increase between 1939 and 1949, but thereafter both declined. DDT spraying has been used since 1952, but the decline between 1949 and 1952 is probably due to there having been no epidemic outbreak of malaria since 1948. [The paper contains 5 tables. The value of the figures would be enhanced by more details of the exact circumstances in which they were collected.]

B. B. Waddy

DUNN, F. L. & BRODY, J. A. **Malaria Surveillance in the United States, 1956–1957.** *Amer. J. Trop. Med. & Hyg.* 1959, July, v. 8, No. 4, 447–55, 4 figs. [13 refs.]

As malaria declines towards the vanishing point in the U.S.A., the vector continues to be present in abundance in many areas, and the risk of infection being imported is constantly present. The total confirmed and presumptive cases in 1956 and 1957 were 129 and 108 respectively, the latter being composed of 97 imported cases (military and civilian) and 11 autochthonous cases. Of these, 2 cases of *Plasmodium vivax* malaria in Cherokee County, Oklahoma, with 4 others in 1956, were true autochthonous malaria. The main sources of imported malaria were Korea and Mexico, but neither on the scale of former years.

Every effort is now being made to confirm the diagnosis of all cases of malaria reported, since malaria has been both grossly under-reported and over-reported at various times in the past. Individual case-surveillance offers the best means of preventing " flare-ups " of malaria.

[See also this *Bulletin*, 1952, v. 49, 923 ; 1953, v. 50, 6.] *B. B. Waddy*

TRINIDAD GOVT. **Annual Report of the Malaria Division, Health Department, Trinidad & Tobago, 1958.** 49 mimeographed pp., 9 graphs. [1959.] Port of Spain, B.W.I.

In 1958, 376 cases of proven malaria were recorded, compared with 274 and 640 in 1956 and 1957 respectively. Reporting was still probably incomplete, though the strength of the malaria field teams was increased in both Trinidad and Tobago and their work, surveying by taking blood films from everyone—not merely those with symptoms—and treating all discovered infections, was invaluable. Actually, in Tobago no autochthonous case of malarial infection has been found since 1953.

Of the two local malaria vectors, *Anopheles bellator* and *A. aquasalis*, each by itself is a poor carrier but when occurring together they amount to a medium vector of unstable malaria. For bionomic reasons *A. bellator* is hardly affected by house spraying, and the attack on it by spraying bromeliads continued during the year.

1958 was made a test year for the change from DDT to dieldrin for house spraying. Although by the Busvine-Nash test *A. aquasalis* appears to have an inherent resistance to dieldrin, in actual practice the recommended dosage, 0·6 gm. per square metre, produced a mortality rate of 75–80% among *A. aquasalis* exposed on treated walls for 1 hour, and it can be said that the results of the year's work have justified the change of insecticide. A planned side-effect has been the virtual eradication of *Aëdes aegypti*.

[For 1957 Report, see this *Bulletin*, 1959, v. 56, 417.] *B. B. Waddy*

BRAY, R. S. **Pre-Erythrocytic Stages of Human Malaria Parasites:** *Plasmodium malariae*. *Brit. Med. J.* 1959, Oct. 10, 679–80.

Although the demonstration of pre-erythrocytic stages of 3 of the 4 human malaria parasites is well-known, those stages in *Plasmodium malariae* have hitherto proved elusive, despite investigations under apparently very favourable conditions. The author had failed to achieve success on 17 separate occasions in such conditions, but now reports success with the use of methods which he had previously outlined [this *Bulletin*, 1958, v. 55, 11].

450 *Anopheles gambiae* were fed on a child in Liberia who had a "reasonable" gametocyte infection with *P. malariae*. Sporozoites appeared in the salivary glands after 14 days: 2 days later the salivary glands of 110 *A. gambiae* were inoculated intravenously into a chimpanzee and those of another 110 *A. gambiae* were inoculated into a second chimpanzee which had been splenectomized 8 days previously. Pieces of liver were removed from these animals 9 days and 8 and 10 days after inoculation respectively. On the 11th day after inoculation the first chimpanzee was killed and a large amount of liver was taken. Pre-erythrocytic schizonts of *P. malariae* were found in liver sections and these closely resembled those of *P. inui* [GARNHAM, *ibid.*, 1952, v. 49, 236] except that the parenchyma-cell nuclei of the host were enlarged.

A full account of this work is promised. *H. J. O'D. Burke-Gaffney*

KRAFT, V. A. **[Influence of Hydrometeorological Factors on Malaria Incidence in the Akmolinsk Region]** *Med. Parasit. & Parasitic Dis.* Moscow. 1959, v. 28, No. 1, 75–9, 1 chart. [In Russian.]

An analysis is given of the factors affecting the incidence of malaria in the Akmolinsk region [of the Kazakh S.S.R. in Central Asia], on the basis of materials on the phenology of the mosquito vectors and the hydrometeorological data observed in the course of 10 years (1946–56).

The breeding places of the mosquito vectors in this region are of 2 types. The first is represented by water collections formed by flooding of the rivers and by erosion of their banks; these reservoirs are the main breeding places of anophelines and are of considerable epidemiological importance, since they are surrounded by human settlements. The second type is represented by shallow stagnant pools in depressions of the steppe. Their level is maintained exclusively by rains, and the water usually contains 1–2% of calcium and sodium salts, but these may reach 40%. Though the brackish waters are not favourable for the breeding of *Anopheles m. messeae*, some larvae develop in the fresher parts of these reservoirs.

The flight of hibernating *A. m. messeae*—which is the only subspecies in this region—begins between the middle of April and the beginning of May, reaching a maximum between the end of April and the end of May, and ceasing not later than by the end of June. Mosquitoes of the first generation appear at the end of May or beginning of June. In the course of 122–167 days, when the temperature is above 10°C., from 3 to 5 winged generations are produced. The season when the temperature is above 16°C., enabling the cycle of sporogony of the parasite to be completed, lasts 80–110 days. At the end of July female mosquitoes in the diapause make their appearance, and they withdraw for hibernation between the middle of August and the beginning of October.

A series of curves illustrates the correlation existing between the external temperature, the height of the snow cover, the number of mosquitoes and the incidence of malaria in the Akmolinsk region. The amount of snowfall, which varies in different years, is of the greatest epidemiological importance, since it determines the level of the rivers, the flooding of which in spring provides water for the breeding places of the mosquitoes. The snow cover also affects the microclimate in buildings occupied by hibernating mosquitoes, by protecting them against cold winds and freezing. Thus when the snow cover is high, the mortality of hibernating mosquitoes is considerably reduced.

In 1946 and 1949, a high snow cover and heavy rainfall in spring and summer resulted in an increase of the anophelogenous area and in the number of mosquitoes in summer. In the presence of a sufficient number of cases of infection these factors promoted its transmission, causing an increase in the incidence of malaria in 1947 and 1950. From then onwards improved antimalarial measures were introduced, with the result that—in spite of favourable conditions in 1954—there was no increase in the incidence of malaria in 1955.

It is noted that on the basis of data regarding the height of the snow cover, the amount of spring-summer rainfall and the prevailing temperature, it is now possible to predict the number of mosquitoes and the effectiveness of malarial transmission for a year in advance. *C. A. Hoare*

BEJARANO, J. F. R. Distribución geográfica de " Anophelini " de la República Argentina. [**Geographical Distribution of Anophelines in Argentina**] *Rev. Sanidad Milit. Argentina.* 1957, Oct.–Dec., v. 56, No. 4, 307–48. [175 refs.]

This paper gives the detailed distribution in Argentina of 25 species and varieties of *Anopheles* and 1 species of *Chagasia.* Natural infections with malaria have been found in *Anopheles pseudopunctipennis* and *A. darlingi*, but 8 other species occurring in the Argentine are noted as vectors elsewhere. Also included in the paper are useful reviews of the problems in the taxonomy of a number of the South American species. *B. R. Laurence*

RACHOU, R. G. Anofelinos do Brasil: Comportamento das espécies vetoras de malária. [**Anophelines of Brazil: Behaviour of Malaria Vectors**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1958, Apr., v. 10, No. 2, 145–81. [Numerous refs.] English summary.

The English summary appended to the paper is as follows:—

" The author summarises what was known about the behaviour of malaria vectors in Brazil, until 1955. A list of Brazilian anophelines is given (51 species, distributed by 2 genus, *Chagasia* and *Anopheles*, and by 7 sub-genus of the latter). Based on their epidemiological importance he classifies the anopheline vectors in two groups: 1) main vectors: *A. darlingi*, *A. aquasalis*, *A. albitaris*, *A. cruzii cruzii* and *A. bellator*, 2) secondary, local or accidental vectors: *A. strodei*, *A. noroestensis*, *A. braziliensis* and *A. homunculus*. There are given considerations on breeding places, density, endophylism (=domesticity), anthropophylism, susceptibility, distribution and dispersion of these species. Every finding of natural infection of anophelines in the country is registered (in tables for the main vectors)."

HOBBS, H. E., SORSBY, A. & FREEDMAN, A. **Retinopathy following Chloroquine Therapy.** *Lancet.* 1959, Oct. 3, 478–80. [17 refs.]

"On present evidence, the retinopathy here described results from treatment with chloroquine compounds. As the corneal changes known to be produced by chloroquine occur also with other synthetic antimalarials, it is possible that these, too, may cause retinal damage—at any rate when they are given in the dosage needed for the treatment of arthritis or lupus erythematosus.

"In the absence of less toxic alternatives, it is unlikely that treatment of these diseases with antimalarial drugs will be discontinued. Nevertheless it appears prudent not to prolong such treatment unnecessarily. Courses should perhaps be short, and they should be controlled by periodic ophthalmic examination."

NWOKOLO, C. **Malarial Chemoprophylaxis in Indigenous Populations.** [Correspondence.] *Brit. Med. J.* 1958, Dec. 20, 1535–6.

The author having first referred to the observations of BRUCE-CHWATT and HORN [this *Bulletin*, 1959, v. 56, 120] recalls that the grounds on which the chemoprophylaxis of malaria in the indigenous populations of endemic areas had until recently been considered undesirable and even dangerous are as follows:

(i) once instituted, such prophylaxis would have to be continued throughout life,

(ii) its use would prevent the natural acquisition of malarial immunity,

(iii) regular maintenance of prophylactic administration would be unlikely in under-developed areas.

Though he accepts the first premise he considers the second to be doubtful, while the third underrates the power and penetration of modern health propaganda methods. He points out that absolute immunity to malaria does not exist, that a population exposed to endemic malaria suffer overt though benign attacks throughout life, and that their freedom from the dangerous manifestations of the disease is purchased at the price of a very heavy mortality in infancy and childhood.

The crucial question is whether, by limited drug prophylaxis, it may be possible to hold at bay the dangerous effects of malaria without preventing the development of natural immunity. The author maintains that the answer is "yes" and states from his personal experience that adult indigenes may be kept free from clinical malaria by the use of antimalarial drugs in much lower dosage than that required by Europeans, a weekly dose of 2 to 3 tablets of proguanil being adequate to achieve this. Infants inherit a degree of immunity from their mothers; they can, he believes, be protected from dangerous malaria by a small dose such as 1½ tablets of proguanil weekly, which is unlikely to cause complete suppression of parasitaemia, and this should permit the build-up of immunity.

The possibility of the development of drug-resistant strains by this incomplete suppression of plasmodial infection is considered to be remote: personal experience suggests that a small but effective prophylactic dose does not have to be increased as the years go by, while the widespread and haphazard use of antimalarials for many years in West Africa has not resulted in the emergence of resistant strains to any appreciable degree.

Midwifery and child welfare services in both towns and rural areas could well undertake the necessary education of the indigenous population along these lines. *J. H. Walters*

SHIDRAWI, G. R. **Notes on Susceptibility of Malaria Vectors to Modern Insecticides in Lebanon.** *Bull. Endem. Dis.* Baghdad. 1959, Jan., v. 3, Nos. 1/2, 31–8.

These data for Lebanon are not later than November 1957. *Anopheles sacharovi* was still very difficult to find; *A. superpictus*, tested as larvae, showed no evidence of DDT resistance. There was some indication, from *A. claviger* tested as larvae, that a natural difference of × 12 in tolerance to DDT existed in this species from two unsprayed villages. *D. S. Bertram*

SINGH, P. & GAD, A. M. **Susceptibility to DDT of Malaria Vectors in Jordan.** *Bull. Endem. Dis.* Baghdad. 1959, Jan., v. 3, Nos. 1/2, 6–12.

"1. The LC_{50} [Lethal Concentration] for *A. superpictus* adults in non-treated areas in Jordan is 0·7% and for *A. sergenti* 0·3–0·4% DDT.

"2. Since adults could not be found in sufficient numbers in the treated areas, susceptibility tests were carried out on larvae in both treated and untreated areas.

"3. The LC_{50} for *A. superpictus* larvae in treated and untreated areas is about 0·01 p.p.m. in both cases, thus indicating no evidence of resistance.

"4. 'Wintering' *A. sergenti* larvae, whether from treated or untreated areas are much less susceptible to DDT than larvae occurring at other times of the year.

"5. The non-appearance of resistance in larvae in Jordan after extensive larviciding with DDT since 1953, could possibly be attributed to the practice of stopping control operations in the winter season (December to March inclusive) when *A. sergenti larvae* are least susceptible to DDT."

WORLD HEALTH ORGANIZATION. **Malaria Advisory Team No. 2. Results of Resistance Tests on Anophelines in Iraq.** *Bull. Endem. Dis.* Baghdad. 1959, Jan., v. 3, Nos. 1/2, 129–33.

The data are those for the year 1957. The principal interest, of DDT-resistance found in *A. stephensi* (adults and larvae), has already been noted [this *Bulletin*, 1957, v. 54, 126; 1958, v. 55, 1078]. A three-page table gives details of the tests and the previous history of the various localities as regards insecticides used. No resistance to DDT was detected in *A. superpictus*, *A. sacharovi*, or *A. pulcherrimus*, nor to dieldrin and lindane in *A. stephensi*. *D. S. Bertram*

ELLIOTT, R. **Insecticide Resistance in Populations of *Anopheles gambiae* in West Africa.** *Bull. World Health Organization.* Geneva. 1959, v. 20, No. 5, 777–96, 6 figs.

Using a larval test method described by himself earlier [this *Bulletin*, 1959, v. 56, 418], the author has measured the spread of resistance in colonies and wild populations of *Anopheles gambiae* from various parts of Nigeria and

from Freetown. Tests with adult *A. gambiae* have shown that wild populations in West Africa consist of mixtures of homozygous resistant, heterozygotes and homozygous susceptible, in various proportions, depending on the extent of insecticide use.

The present paper follows this type of investigation with the larval test. However, since he has been unable to make successful crosses in West Africa, no dose/kill curves for heterozygotes are available. He infers these by calculation, using results with mixed populations from which expected deaths of homozygous susceptible and expected survival of homozygous resistants have been subtracted. From these operations he has estimated proportions of the three genotypes and the LC50 for heterozygotes with fair consistency. The proportions of genotypes in some areas conform to expectations of the Hardy-Weinberg law; but the author suspects that this may be coincidental, since DAVIDSON [*ibid.*, 1958, v. 55, 1078] has found heterozygote males sterile. This should upset the balance and tend progressively to reduce numbers of whichever gene is in the minority. However, observations on a mixed laboratory colony did not follow this expectation. [In any case, it has now been established that male heterozygote sterility does not occur in all resistant-susceptible crosses of *A. gambiae* (Davidson, personal communication).]

The analysis of larval populations from Freetown, Sierra Leone, established the presence of dieldrin resistance in that area (about 8% homozygotes and 58% heterozygotes); but the data for Ibadan, W. Nigeria, do not show definite existence of resistance there. *J. R. Busvine*

UNGUREANU, E. **Observations on the Susceptibility of *Anopheles gambiae* to Dieldrin assessed by Topical Application.** *Bull. World Health Organization.* Geneva. 1959, v. 20, No. 5, 990–94.

The author used the micro-application pipette already described [this *Bulletin*, 1959, v. 56, 1291] to apply small (0·1 to 0·35 cmm.) drops of alcoholic solutions of dieldrin to the backs of normal and resistant *Anopheles gambiae*. The mosquitoes were etherized for handling and kept 24 hours after treatment before mortality counts were made. By varying drop size and concentration, it was possible to obtain dose/kill regression lines and calculate LD50. When these data were compared with LC50 obtained with the Busvine/Nash method for the same strains [DAVIDSON, *ibid.*, 1958, v. 55, 1078], both sets of results gave similar orders of relative resistance.

	LD50 (μgm. insect)	LC50 (%)
Susceptible (Diggi strain)	0·002	0·05–0·07
Hybrids (Kano-Diggi)	0·006	0·4–1·1
Resistant (Kano strains)	>2·5	>>4

[Similar agreement is shown in comparisons of topical applications of DDT by micro loop and Busvine/Nash results reported by LIVADAS and THYMAKIS, *Bull. World Health Organization*, 1956, v. 15, 403 (this *Bulletin*, 1957, v. 54, 918):—

	LD50 (μgm. insect)	LC50 (%)
A. sacharovi, at Asterion (August 1954)	0·258	2·71
A. sacharovi, at Agoulinitsa (July 1954)	0·115	1·39.]

In the present paper the author describes tests with Diggi-Kano hybrids of *A. gambiae* in different nutritional states. He also claims to have found a morphological difference between resistant and normal strains of this insect.

J. R. Busvine

Martínez Palacios, A. Ecologia y resistencia. [**Ecology and Resistance**] *CNEP Bol.* Mexico. 1959, Jan.–Mar., v. 3, No. 1, 38–40.

The English summary appended to the paper is as follows:—

"In México, the selection of a dieldrin resistant strain of *A. p. pseudopunctipennis* was done in less than 18 weeks. Until now the phenomenon is restricted to rice growers localities. Rice fields, becoming breeding places, gave continuity and speed to the development of this phenomenon, producing constantly enough anophelines. The species showed its definite endophilic behaviour by developing resistance only with intradomiciliary spraying. Concomitance of coverage and mosquito season also helped.

"This experience may be used to study in nature the capability of different species to develop resistance provoked experimentally in this ecological background. Capable species will give a fast answer."

[See this *Bulletin*, 1959, v. 56, 517 and Erratum, *ibid.*, 1010.]

Rachou, R. G., Moura Lima, M. & Memória, J. M. P. Primeiras provas de determinação da susceptibilidade de anofelinos brasileiros aos inseticidas. III. *Anopheles* (*Nyssorhynchus*) *tarsimaculatus* (= *aquasalis*), em Guarapiranga (Estado do Maranhão). [**Tests of Susceptibility of Brazilian Anophelines to Insecticides. III.** *Anopheles tarsimaculatus* (*aquasalis*) **in Guarapiranga**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1958, Jan., v. 10, No. 1, 65–78. English summary.

The tests were made in 1957 at Guarapiranga, a rural locality of Brazil, with a few houses, most of which were treated with DDT twice in the preceding year or so.

Several different ways of catching *Anopheles tarsimaculatus* (= *aquasalis*) adults and of treating them before and after test against DDT by the Busvine-Nash test are compared for their effect on the LD50 value. Recommendation is to catch in the evening outdoors on human bait, to expose in test about 12 hours later (the following day), and to offer honey during the 24-hour period preceding the mortality count. The LD50 was then 0·55% ; this is advocated as the base-line for normal susceptibility. Omission of honey reduced the figure to 0·29% If the mosquitoes were captured indoors, kept 12 hours and fed on honey after exposure, the value was 0·33%. Mosquitoes caught on human or horse bait indoors, tested against the DDT papers within 3 hours, and then fed on honey, gave LD50 values between 0·85% and 1·26%.

Results are tabulated in detail. *D. S. Bertram*

Beliatsky, D. P. & Rubinshtein, B. B. [**Malaria Control in the Bialoruss Soviet Republic (on the Occasion of the 40th Anniversary of its Existence)**] *Med. Parasit. & Parasitic Dis.* Moscow. 1959, v. 28, No. 1, 70–75. [In Russian.]

In the past the region occupied the Bialoruss Republic was one of the endemic areas of malaria in Russia, where the natural conditions of the terrain

and climate, as well as the occupation of the inhabitants (forestry, agriculture), represented epidemiological factors which were favourable for the spread of this disease. The available figures for the period before the First World War show that between 1895 and 1913 the incidence of malaria in different provinces of Bialorussia varied from 404·6 to 7·0 per 10,000 of the population. The situation deteriorated considerably during and shortly after the First World War, owing to the movements of troops and refugees, and famine resulting from the German and Polish occupation of the country. However, statistical data regarding the dynamics of the disease are available only since 1924, after the advent of the Soviet rule.

An analysis of the incidence of malaria during the last 40 years shows that there were three peaks in the morbidity of this disease: in 1925, 16,548 cases; in 1939, 31,030 cases; and in 1945–1946 up to 2527·5 per 10,000 in one area alone. The rise in the 1920's was due to the continuation of the epidemics of 1914–18, followed by enemy occupation; the second rise was connected with the migration of the population in the 1930's, while the third was the result of conditions during the Second World War and the German occupation of the country. Malaria in Bialorussia—as in central U.S.S.R.—is represented by the benign tertian form with a long incubation period, but during the Second World War cases of quartan and subtertian malaria were introduced by immigrants from other parts of the Union.

Rational measures for the control of malaria were started in 1924, when the first antimalarial station was opened. By 1940 there were 49 such centres, while after the Second World War their number rose to 101. As the result of prophylactic and therapeutic treatment, as well as of measures directed against the vectors, undertaken by local health authorities under the guidance of the Institute of Malaria in Moscow, by 1951 malaria in Bialorussia had ceased to be a disease of primary importance: in comparison with the incidence in 1940, the number of cases in 1951 was 5 times lower, in 1952, 11 times, in 1953, 39 times, in 1954–5, 79 times and in 1956, 470 times; in 1957 there were only 24 cases, 11 of whom contracted the infection in Middle Asia, while during the first half of 1958 only 3 cases were reported.

The authors conclude that malaria, which was formerly a scourge of the Bialorussian people, has been fully liquidated in the course of the 40 years since the republic was founded. Detailed statistical data are adduced in a number of tables. *C. A. Hoare*

CHRISTAL, F. A. **Summer Huts and Spraying Campaigns in Northern Iraq.** *Bull. Endem. Dis.* Baghdad. 1959, Jan., v. 3, Nos. 1/2, 90–95.

Summer huts are temporary erections built by the Kurdish villagers of Northern Iraq as summer sleeping accommodation. They are low, flimsy and may or may not have walls. They may be close to the village or some distance away. *Anopheles sacharovi* and *A. superpictus* are found in them, in large numbers, and it is essential to include them in the residual spraying campaign. Their erection and occupation is spread over some weeks. In order to avoid on the one hand leaving early huts unsprayed for some time and on the other hand missing altogether those built later on, it is necessary to conduct two spraying campaigns each summer. This is a task of some magnitude, since all summer hut villages must be visited by spraying teams, many of them on foot.

B. B. Waddy

Basu Mallik, K. C. & Ganguly, N. C. **The Response of Malarial Rat Liver to Injury by Carbon Tetrachloride.** *J. Path. & Bact.* 1959, July, v. 78, No. 1, 87–93, 7 figs. on 2 pls. [11 refs.]

"Livers of rats suffering from a latent malarial infection with *Plasmodium berghei*, or recovering from an acute attack are not more vulnerable to the hepatotoxic action of CCl_4 than the livers of healthy rats.

"Hepatic damage is more extensive after the injection of CCl_4 into a rat while it is suffering from an acute attack, and there is delayed removal of debris in the liver of such an animal.

"There is rapid regeneration of liver tissue in rats suffering from acute malarial infection and exposed to the action of CCl_4, if the infection is checked by an antimalarial drug, provided the parasitaemia is not too far advanced."

Peláez, D. & Pérez-Reyes, R. Estudios sobre hematozoarios. IX. Una nueva especie de *Plasmodium* de reptiles mexicanos parásita de *Basiliscus vittatus*. [**Studies on Haematozoa. IX. A New *Plasmodium* Species from Mexican Reptiles Parasite in *Basiliscus vittatus***] *Rev. Latinoamer. Microbiol.* Mexico. 1959, Mar., v. 2, No. 1, 41–50, 32 figs. [10 refs.] English summary.

TRYPANOSOMIASIS

In this section abstracts are arranged as far as possible in the following order:—African—*human, animal;* American—*Chagas's disease and other trypanosome infections. In each form the following order is followed:*—*epidemiology, aetiology, transmission, pathology, diagnosis, clinical findings, treatment, control.*

Tanganyika. **Medical Department. Sleeping Sickness Service Annual Report 1958** [Apted, F. I. C.]. 17 mimeographed pp. + 17 pp. of tables & 1 folding coloured map. 1958, Dec. Tabora.

This report records a slight rise in sleeping sickness notifications as compared with 1957 [see this *Bulletin*, 1958, v. 55, 1085], due partly to two small outbreaks but partly also to a general rise in incidence which may betoken a cyclical increase of transmission such as that which occurred in 1954. The outbreak in Kasulu in the Western Province was due to resettlement by permission of an inexperienced administrator, in a fertile but fly-infested valley. Other small outbreaks were associated with a road-building scheme, and among a labour force clearing bush for *Glossina swynnertoni* control. This last was of interest because though the area is uninhabited 2 Europeans were infected there in 1957, and because a policeman became infected 3 months after withdrawal of the labour force.

A number of interesting matters are discussed in the report. Keeping in step with the times the population in one area has decided to pay increased taxes for the employment of full-time clearing gangs, rather than continue the pleasant, annual social event of communal clearance work. It is pointed out that without great communal effort in the past the present state could not

have been reached. Pentamidine prophylaxis, which has been maintained for 5 years in a population of 3,000 in a unique *Trypanosoma gambiense* focus, is being stopped and control of *G. palpalis* by dieldrin spraying substituted. Tribute is paid to the work of the field staff, including settlement officers and subordinate personnel in both medical and settlement spheres; they are doing valuable work and many can accept the responsibility of working unsupervised. Nitrofurazone is still under trial and has been successful in 5 patients with *T. rhodesiense* infections relapsing after Mel B treatment. An investigation of chemoprophylactics against *T. rhodesiense* is being made in rats. The report contains 10 tables reporting the incidence of human trypanosomiasis by districts, most of which are accompanied by interesting commentaries.

T. H. Davey

FROMENTIN, Huguette. Trypanosomiase humaine accidentelle à *Trypanosoma gambiense*. Considérations sur la souche infectante et sur la réponse de l'organisme. [**Accidental Human Infection by** *Trypanosoma gambiense*. **Observations on the Infecting Strain and the Host Response**] *Bull. Soc. Path. Exot.* 1959, Mar.–Apr., v. 52, No. 2, 181–8. [11 refs.]

A strain of *Trypanosoma gambiense* ("Yaoundé normal") was isolated in the French Cameroons in 1934 and has been kept by syringe passage through guineapigs, rats and mice. It kills mice in 5 to 8 days. One line of this strain has been rendered tryparsamide-resistant (90 mgm. per 20 gm. animal) in mice; this change remains stable and is still evident on transfer of "Yaoundé resistant" to rats. An accidental injection of this particular line of the strain into man from a rat occurred in November 1957, 23 years after the original isolation. A similar accident with the parent strain also has been reported earlier [this *Bulletin*, 1951, v. 48, 1087].

Following this latest episode, on the night of the 10th day the victim of the accident had a shivering attack; the following day there was fever; on the 13th day trypanosomes were readily found in the man's blood; mice were inoculated with it, and became infected. The strain so obtained was named "Huguette" and has been maintained. The patient was treated with lomidine; he rapidly recovered and is considered to be cured. Lumbar puncture in May 1958, and again 7 months later (13 months after the accident), yielded a normal fluid.

The 3 strains—Yaoundé normal, Yaoundé resistant, and Huguette—have been closely studied and compared by measurements in different hosts, for their sensitivity to drugs, and for their production of antibodies. The author has found that the strain underwent neither morphological nor biological changes as a result of its passage through man. Its reaction to various drugs has not been altered by this passage; it remains as tryparsamide-fast as before it. Examination of the blood of the man accidentally infected showed the presence of trypanosome agglutinating antibodies for 7 months, and of lysins for 14 months. Complement-fixation tests were weakly positive at 2 months with trypanosomal antigens (*T. equiperdum*, and *T. gambiense* Yaoundé), but were negative within 5 months. 0·5 ml. of serum of the patient, taken 2 months after infection, on peritoneal injection did not cure mice with a Huguette parasitaemia (80,000 trypanosomes per cmm.); but the serum in similar dosage when taken between the third and 14th months did so. Taken up to the 14th month 0·5 ml. of serum mixed with 1 ml. of heavily infected blood 3

minutes before injection resulted in some retardation of development of Yaoundé resistant and of Huguette infections in mice, but did not affect Yaoundé normal (the parent strain) infections. The author comments on the specificity of the antibodies produced, the more durable of which were limited in action to the infecting strain.

[This record and the observations, in conjunction with those of ROUBAUD and PROVOST (*loc. cit.*), afford information of much present interest and importance.] *A. R. D. Adams*

MÜHLPFORDT, H. Vergleichende Untersuchung über die Wirkung des Trypaflavins auf den Blepharoplast verschiedener Trypanosomenarten. [**Comparative Study on the Effect of Trypaflavin on the Kinetoplast of various Trypanosomes**] *Ztschr. f. Tropenmed. u. Parasit.* Stuttgart. 1959, Apr., v. 10, No. 1, 19–30, 4 figs. [18 refs.]

It is well known that the kinetoplast may be absent in individual trypanosomes and that mutant akinetoplastic strains may arise spontaneously. The same condition has been induced in normal strains by treating infected animals with various chemicals.

In the present paper the author describes the results of a comparative study of the effect of trypaflavin on the kinetoplast of a number of mammalian trypanosomes maintained in mice. Trypaflavin was used in a concentration of 1:2500, in doses of 0·01 cc. per gm. of body weight of the host, administered intraperitoneally. For examination of the trypanosomes the best results were obtained by treating blood films, after fixation in methyl alcohol, with N/1 HCl at 60°C. for 10 minutes, and staining by Giemsa's method. When examined by phase contrast microscopy, the kinetoplast and nucleus of the trypanosomes can be clearly seen as blue-stained bodies, and the effect of trypaflavin can thus be readily assessed.

Repeated treatment of different species of trypanosomes with trypaflavin caused the complete disappearance of the kinetoplast in the strain after the following periods (in days): *Trypanosoma equiperdum* 54, *T. evansi* 81, *T. brucei* 121, *T. gambiense* 122. On the other hand, in *T. congolense* and *T. lewisi* the akinetoplastic condition could be produced only in 64% and 55% of the trypanosomes respectively, whereas the treatment had no effect upon *T. cruzi*, which retained its normal structure.

The disappearance of the kinetoplast under the influence of trypaflavin proceeded in two ways: in *T. lewisi* and *T. congolense* it moved forwards beyond the nucleus and was extruded at the anterior end of the body, while in the remaining species (*brucei* group) it disintegrated. There is reason to believe that the kinetoplast is affected by the chemical only during the period of cell division.

The paper is illustrated by photomicrographs and the course of disappearance of the kinetoplast in *T. lewisi* is shown in graphs. *C. A. Hoare*

SOLTYS, M. A. **Immunity in Trypanosomiasis. III. Sensitivity of Antibody-Resistant Strains to Chemotherapeutic Drugs.** *Parasitology.* 1959, May, v. 49, Nos. 1/2, 143–52. [13 refs.]

A normal strain of *Trypanosoma brucei* passaged in mice or preserved at –70°C. was compared with its immune-serum resistant variant [Soltys, 1957,

this *Bulletin*, 1958, v. 55, 739]. Three types of test were performed: (1) incubation of the trypanosomes with graded concentrations of drug *in vitro* followed by injection of the organisms into mice to test their viability; (2) direct therapeutic test of graded doses of the drug on infections in mice; and (3) prophylactic tests of the drug in preventing infection in rabbits challenged with the infection at times varying from 2 to 5 months. In each test a marked increased resistance was demonstrated in the serum-resistant strain over the normal strain for both the drugs, suramin and Antrycide. In addition, a variant of the normal strain made resistant in mice to suramin was found to be as sensitive to immune serum as the normal strain.

[The abstracter considers that this is the most convincing demonstration published to date of the fact that some trypanocidal substances owe part of their activity to the immune response of the host.] *W. E. Ormerod*

PAGE, W. A. & MCDONALD, W. A. **An Assessment of the Degree of Man-Fly Contact exhibited by *Glossina palpalis* at Water-Holes in Northern and Southern Nigeria.** *Ann. Trop. Med. & Parasit.* 1959, June, v. 53, No. 2, 162–5.

The basis of assessment was to capture, daily throughout a month, *Glossina palpalis* coming to fly boys, and release the flies after applying a colour mark. Reappearance of marked flies was noted daily and continued for a further month after marking was stopped. This was done at selected watering places in Northern and Southern Nigeria during dry and wet season periods. On the assumption that it requires 18 days for a fly to become infective, there was crucial interest in comparing the numbers of marked flies recovered more than 17 days after marking. Some adjustments of this basic plan were necessary for reasons which are discussed. These are taken into account in comparing the different results for locality and seasons.

A table shows that in Southern Nigeria never more than 0·8% of flies were recaptured after 17 days, whereas in the Northern territory the percentage is from 3·9 to 6·9%. Thus, repeated man-fly contact is greater in the North and less in the South, and this experiment confirms the concept that this is at least one reason for the rarity of sleeping sickness in the Southern area. It is of interest, too, that in the Northern territory man-fly contact was confirmed as greater in the dry than in the wet season. *D. S. Bertram*

FORD, J., GLASGOW, J. P., JOHNS, D. L. & WELCH, J. R. **Transect Fly-Rounds in Field Studies of *Glossina*.** *Bull. Entom. Res.* 1959, Aug., v. 50, Pt. 2, 275–85, 3 figs.

"The fly-round has for long been regarded as the most satisfactory way of following fluctuations in populations of tsetse flies (*Glossina*) and locating areas of concentration. It consists of a path cut through bush so as to traverse the principal vegetation communities and is divided into sections, corresponding to the latter, on each of which the flies are caught. A modification now widely used but not previously described in detail is termed a line transect or transect fly-round; this follows an arbitrary course along straight lines that may be orientated with regard to the topography and is divided into numerous short

sections of equal length terminating at posts at which flies are caught. In its simplest form it follows a straight course, but various patterns are used including an angular spiral. It facilitates the collection of quantitative data on tsetse density and the factors (such as vegetation) that affect it, and their analysis is possible in more detail than was the case when the fly-round was laid out according to a preconceived notion of vegetational relationships. This is illustrated by data from a fly-round at Shinyanga, Tanganyika, consisting of six sides, each of 2,000 yd., of two diagonally adjoining squares, that was divided originally into nine sections of varying lengths representing the floristic communities traversed, and subsequently into 120 sections each 200 yd. long. Comparison of the catches of non-teneral males of *G. swynnertoni* Aust. grouped according to the two methods emphasises the much greater detail provided by the second of them. The transect fly-round is easy to lay out and operate and is thought likely to be particularly useful in connection with reclamation work.

"The effect of varying the section length was investigated for *G. swynnertoni* at Shinyanga, *G. pallidipes* Aust. in Nyanza Province, Kenya, and *G. austeni* Newst. in Zanzibar. With the first, progressively fewer flies of all categories except teneral males were caught as the section length was increased progressively from 50 to 200 yd.; with the other species a similar tendency was apparent, but not significant. The results emphasise a point long recognized but often neglected, that data from fly-rounds reflect, in part, the reaction of tsetse populations to the behaviour of the catching party. That this reaction, termed the availability, is itself inconsistent is shown by catches of *G. pallidipes* on a fly-round done daily for a month, in which differences between catches on consecutive days, sometimes exceeding 3:1, must represent changes in availability, not in absolute population.

"Data from the transect fly-round can be analysed so as to indicate sections where the catches deviate significantly from those expected on the assumption that they are distributed according to a Poisson series, and where there may thus be presumed to be areas of concentration of the population, or the reverse. A Table is provided to facilitate such analysis."

MITCHELL, B. L. & STEELE, B. **A Report on the Distribution of Tsetse Flies in Nyasaland and some Recommendations for Control. Submitted May, 1954.** 67 pp., & 8 loose-leaf maps. 1956. Zomba: Govt. Printer, Nyasaland. [5s. 6d.]

The report provides a consideration of trypanosomiasis of man and of cattle in Nyasaland, with special regard to the problems and anxieties posed in terms of developing the country in post-war years. Recommendations for investigating the possibilities of effective control of tsetse are outlined and organization, staff and training required to put policy into effect are briefly noted. The report, which was published in 1956, reveals that only *Glossina morsitans* and *G. brevipalpis* were found, the former in widely distributed fly-belts of relatively open savannah bush, the latter associated more with riverine or other thicket patches towards the north and also about midway along the shore of Lake Nyasa.

Cattle trypanosomiasis is the major curb to development; human sleeping sickness continues to be infrequent or rare, although in parts contact between

G. morsitans and man would seem to provide conditions encouraging outbreaks. Although only a milder form of cattle trypanosomiasis is transmitted by *G. brevipalpis*, this suffices to make mixed farming unattractive where this species occurs.

There are detailed accounts of the characteristics of 8 tsetse belts, presenting for each the topography, climate, communications and vegetation in relation to fly, and summing for each belt the possibilities for fly control. Maps in an end folder amplify the text. Some general vegetational associations are also given graphically and discussed in the text. A considerable section considers established practices in tsetse control in terms of Nyasaland's problems. Correct land usage is considered the basic principle for economic control of tsetse for the territory. Use of discriminative clearing is recommended to assist progressive development of new areas from which game and fly (*G. morsitans*) should recede as human populations approach 20–25 families per square mile. Insecticides were thought unsuitable, except for *G. brevipalpis* in isolated special concentrations of thickets. It is interesting to note now the hesitance in accepting game destruction for control of *G. morsitans*, and evidence quoted and opinion expressed that this should, if done, include the killing of pig and warthog as being very important to the economy of *G. morsitans*. Special problems discussed separately are forest, and game, reserves and bush fire policy.

[Page numbers in the contents are consistently three less than the actual pagination.] *D. S. Bertram*

Da Silva, J. M. Notes sur l'étude de la trypanosomiase animale au Mozambique. [**Studies on Animal Trypanosomiasis in Mozambique**] *Bull. Epizootic Dis. of Africa.* 1959, June, v. 7, No. 2, 137–47. [10 refs.]

Urso, B. & Ilardi, I. Le alterazioni del sistema reticolo endoteliale nella tripanosomiasi (Castellanosi) sperimentale da *Trypanosoma equinum*. [**Alteration of the Reticulo-Endothelial System in Experimental** *Trypanosoma equinum* **Infection**] *Arch. Ital. Sci. Med. Trop. e Parassit.* 1959, Aug., v. 40, No. 8, 417–36, 6 figs. [Numerous refs.]

The English summary appended to the paper is as follows:—

"Researches on the experimental trypanosomiasis from Trypanosoma equinum were made by the authors on guinea-pigs. The histopathologic changes found in the R.E.S. of these animals' liver and spleen were those usually observed when the R.E.S. of these organs is stimulated by foreign elements either from parasitic or microbial origin.

"The authors conclude by interpreting this affection as a parasitic reticuloendotheliosis."

Rodenwaldt, E. Geographie der Chagas-Krankheit. [**Geographical Distribution of Chagas's Disease**] *Ztschr. f. Tropenmed. u. Parasit.* Stuttgart. 1959, Apr., v. 10, No. 1, 1–5.

This paper discusses in a general way how, based on clinical evidence, Chagas's disease may now be seen to have a considerably greater distribution in Central and South America than that summed cartographically in 1954 by Dias [Welt-Seuchen-Atlas, this *Bulletin*, 1955, v. 52, 499]. This work is the only

reference cited; it was edited by the author. Brief note is made of factors in the biology, distribution and efficiency of triatomids as vectors, particularly *Triatoma infestans, T. dimidiata, Panstrongylus megistus* and *Rhodnius prolixus*, with a call for intensified study of triatomid biology in the interests of effective control. *D. S. Bertram*

PESSÔA, S. B. Biologia dos triatomíneos. [**Biology of Triatomata**] *Rev. Goiana Med.* 1959, Jan.–Mar., v. 5, No. 1, 3–11. [18 refs.] English summary.

A review and discussion.

LAVOIPIERRE, M. M. J., DICKERSON, G. & GORDON, R. M. **Studies on the Methods of Feeding of Blood-Sucking Arthropods. I.—The Manner in which Triatomine Bugs obtain their Blood-Meal, as observed in the Tissues of the Living Rodent, with some Remarks on the Effects of the Bite on Human Volunteers.** *Ann. Trop. Med. & Parasit.* 1959, June, v, 53, No. 2, 235–50, 7 text figs. & 6 figs. on 2 pls. [41 refs.]

This paper opens with a useful review of the biting mechanism of different insects, with special emphasis on direct observations by microscopical devices as initiated in 1939 and since further developed by Gordon and his colleagues. Experiments now reported are on the biting mechanism of *Rhodnius prolixus*, *Triatoma infestans* and *T. protracta*, as seen in bugs feeding on the ear of a live mouse under a suitably adapted binocular, stereoscopic microscope [this is illustrated]. There is supporting information from histological work. The morphology of the mouth parts, notably the operative mandibles and maxillae, is described. The stouter mandibles are tipped with coarse backwardly-projecting teeth; they lie on the flanks of the two bristle-like maxillae which are shaped and apposed to form—seen transversely—a large food canal and a smaller salivary canal. An interesting detail is that the right maxilla is longer than the left and tapers to an uneven hair-like end, while the other is relatively broad at its extremity although this, however, abruptly tapers to a point.

The mandibles effect, by alternate movements, the cutting and penetration first. The maxillae are then protruded well beyond the mandibles into the tissues and are notable for bending and flexing. Indeed, the mandibles remain rigid and anchored by their distal barbs just within the skin surface. Although haemorrhages are formed by the probing maxillae, feeding is always finally direct from a capillary. Location of the accepted capillary appears to be by chance. The tapering right maxilla extends a considerable way into the lumen of the capillary. The broad tip of the left maxilla takes apparently a hood-like shape and seems to remain either just inside or outside the capillary wall. This hood is, then, the functional mouth. It is accepted, on other grounds, that saliva is pumped in during feeding, but this was not detected by direct observation.

14 volunteers submitted to bites from, mainly, *R. prolixus*; 11 could be presumed previously unexposed to triatomid bite and 3 possibly not so. None reported pain during, or just after, biting; a slight tingling at most. No immediate wheal was ever observed, nor pruritus, nor late reactions on first bite. Irregular bites over many months elicited eventually only a 24–48-hour

delayed reaction in the form of an erythematous area at the bite; in 1 of 3 cases this was severe. [A footnote refers to recent literature reporting immediate reactions after long exposure to triatomine bites.]

There is some discussion of the lack of wheal and pruritus, as observed and as is probably widely true, since reactions to bites might be thought to facilitate entry of *T. cruzi* defaecated on a host during feeding. At present it seems premature to attempt any interpretation of the role of histamine, anticoagulants, and a haemolytic factor in bug saliva, and histamine in bug faeces, in the pathology of inflammation or the manner of successful invasion of the host by *T. cruzi*.

Photomicrographs and line drawings illustrate the subject well.

D. S. Bertram

Amato Neto, V. Contribuição ao conhecimento da forma aguda da doença de Chagas. [**Study of the Acute Form of Chagas's Disease**] [Thesis.] 332 pp., 49 figs. [Numerous refs.] 1958. São Paulo: Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, Avenida Ademar de Barros, Brazil.

This comprehensive monograph, which was presented as a thesis to the Faculty of Medicine of the University of São Paulo, Brazil, has as its starting point the relative paucity of full studies on the acute form of Chagas's disease.

The author has made an exhaustive study of 31 patients with this disease, 24 of them infected by bugs, 6 by blood transfusion and one, a child of 4 months, in whom transmission was not determined, except that bug transmission was excluded.

There are 7 chapters, and a list of references amounting to 18 pages.

The first chapter is introductory. The first 24 patients were aged 11 months to 35 years but mostly above 6 years of age, adolescents or young adults. 18 acquired the infection in São Paulo and 6 in Paraná. The second chapter gives full details of all these 24 patients and sets out the clinical features in tables, photographs, skiagrams and figures, together with radiological and electrocardiographic findings.

The third chapter discusses aetiological diagnosis and gives the results of blood smear examinations, xenodiagnosis, sternal puncture, blood culture, tissue examination and complement fixation.

In the fourth chapter, the author sets out at length and in many tables the results of subsidiary tests, for example the blood picture, a considerable range of liver function tests, and various serum estimations, including the Sabin-Feldman test for toxoplasmosis.

The fifth chapter discusses treatment and the considerable number of drugs tried, with varying degrees of success and failure.

The sixth chapter deals on similar lines with the 6 cases transmitted by blood transfusion and that of undetermined transmission.

The last chapter summarizes and discusses the findings as a whole. It would not be possible, in the space available, to cover all the detailed findings presented by the author: but the reader, even without a knowledge of the Portuguese language, will find in the original a very large amount of tabulated information which is a considerable contribution to our knowledge of the acute stage of Chagas's disease.

H. J. O'D. Burke-Gaffney

Salum, J., Lacaz, P. da S., Borges, C., Rassi, A. & De Rezende, J. M. Eletroforese das proteínas séricas na fase aguda da doença de Chagas. Comportamento evolutivo observado em 15 casos. **[Serum Protein Electrophoresis in the Acute Form of Chagas's Disease. Follow-Up Study in 15 Cases]** *Rev. Goiana Med.* 1959, Jan.–Mar., v. 5, No. 1, 13–21, 3 figs. [18 refs.]

The English summary appended to the paper is as follows:—

"The authors studied the serum protein of 15 cases with the acute form of Chagas disease by paper electrophoresis. Serial determinations were made and its behavior pattern was correlated with the natural course of the disease. The total protein was determined in all cases. The results given as the over all average of the first determination of each particular case showed total hypoproteinemia, hypoalbuminemia and hyperglobulinemia, the latter on account of the alpha-2 and gamma fractions. The alpha-1 and beta globulin fractions were within normal limits. As far as the evolutive course was concerned the authors noted increase of the total protein and a tendency towards normal pattern for the alpha-2 and gamma globulin."

[See this *Bulletin*, 1959, v. 56, 703.]

Porto, C. C. O ECG em indivíduos de baixa idade submetidos à reação de Machado-Guerreiro. **[Electrocardiographic Changes in Children Submitted to the Machado-Guerreiro Test]** *Rev. Goiana Med.* 1959, Jan.–Mar., v. 5, No. 1, 31–42, 2 figs. [46 refs.]

The English summary appended to the paper is as follows:—

"The author studied the EKG changes of a children's population who were apparently normal and healthy as far as Chagas disease was concerned. 17 cases gave a positive Machado-Guerreiro reaction; 58 were negative and in 3 cases the test was not conclusive. Ventricular premature beats and marked bradycardia in the group with negative Machado-Guerreiro reaction made him suspect the possibility of Chagas disease and the turning of the reaction to positive in the future. In the positive group there was one case with right-bundle-branch-block and one case with first degree atrioventricular block.

"He concludes that the above mentioned EKG findings, the earliest ones seen in his material, probably represent the first step in the evolutive course of Chagas disease and that it is desirable to follow these patients for life before any conclusive answer can be drawn."

LEISHMANIASIS

In this section abstracts are arranged as far as possible in the following order:—visceral, cutaneous, muco-cutaneous.

Auguadra, P. Caso di leishmaniosi nel cane in Somalia. **[A Case of Canine Leishmaniasis in Somalia]** *Ann. Soc. Med. Igiene Trop. Somalia.* 1954–8, v. 2, 179–81. English summary (1 line).

HOEKENGA, M. T. & TUCKER, H. A. **Treatment of American Dermal Leishmaniasis with a special Oral Dosage Form of Tartar Emetic.** *Amer. J. Trop. Med. & Hyg.* 1959, May, v. 8, No. 3, 342–5. [10 refs.]

On the Isthmus of Panama muco-cutaneous types of dermal leishmaniasis, characteristic of infection with *Leishmania brasiliensis* elsewhere, are rarely seen [this *Bulletin*, 1954, v. 51, 255; 1957, v. 54, 275]. The common Panamanian type of lesion takes the form of a chronic ulcer on the extremities in a person whose occupation leads him to spend much of his time in the forests of this region. Without specific therapy these ulcers take about a year to heal, leaving papery, atrophic scars; the subject is subsequently resistant to re-infection.

Stibophen by intramuscular injection has been the standard remedy but carries two disadvantages, firstly that multiple injections are required, secondly that though healing of the ulcer rapidly follows there is a tendency for verrucous local relapses to occur. The authors, having noted that oral tartar emetic had been used with success in patients suffering from dermal leishmaniasis in Costa Rica, determined to try the same therapy in Panama. A special preparation of the drug giving a prolonged absorption time was supplied in capsule by the Upjohn Company of Kalamazoo, Michigan, each capsule containing 23·7 mgm. of potassium antimony tartrate.

Clinical trial in 30 volunteers showed that nearly all of them were able to tolerate 1 capsule 3 or 4 times a day for periods of 12–45 days. The subjects excreted antimony in the urine in concentration equal to that in the subject who had received an equivalent dose of the metal by the intramuscular route in the form of stibophen, yet the total antimony thus excreted during the 48 hours after administration was less when the drug was given by the oral than by the intramuscular route. [The abstracter is puzzled by this statement and concludes that the 2 subjects to whom the salt was given orally secreted less urine than the single control who received stibophen by injection. Perhaps this experiment should have been repeated.]

3 adult patients with characteristic ulcers on the extremities, in whom Leishman-Donovan bodies had been demonstrated by biopsy of the affected skin, were treated with 3 capsules of tartar emetic a day to a total of 52 (= 1·23 gm. of the salt), 120 (= 2·84 gm.) and 72 (total 1·71 gm.) capsules respectively. Complete healing occurred in each patient, though slowly, taking 4·5, 8 and 9 weeks respectively. None of these patients showed a relapse during the succeeding 18 months. [This type of dermal leishmaniasis common in Panama clearly bears a close analogy to that seen in the chicleros of British Honduras [see GARNHAM and LEWIS, *ibid.*, 1959, v. 56, 930]. Oral tartar emetic therapy as described, though promising, clearly requires further evaluation.] *J. H. Walters*

FEVERS OF THE TYPHUS GROUP

In this section abstracts are arranged as far as possible in the following order:—general; louse-borne typhus, flea-borne typhus, mite-borne typhus; rickettsialpox; tick-borne typhus; Q fever, other rickettsial diseases.

VARELA, G. & ROCH, E. Estudio serológico de la distribución del tifo en la República Mexicana en 1958. **[Serological Study of the Distribution of Typhus in the Mexican Republic in 1958]** *Bol. Epidemiológico.* México. 1959, Jan.–Feb.–Mar., v. 23, No. 1, 33.

140 sera from patients in 11 different States of Mexico, and having a clinical diagnosis of typhus and a positive Weil Felix reaction, were studied by agglutination tests with *Rickettsia prowazeki* and *R. mooseri* antigens.

The results are shown in a table, which also indicates the geographical distribution of the cases. 90·7% were positive with *R. prowazeki* antigen and 9·3% with *R. mooseri.*

44, 34, 12 and 12 of the 127 cases of epidemic typhus were respectively from Oaxaca, Chiapas, Hidalgo and Michoacán, while 4 and 3 respectively of the 13 cases of murine typhus were from Oaxaca and Guanajuato.

H. J. O'D. Burke-Gaffney

DOLEZAL, Marian. Badania nad swoistością odczynu antyglobulinowego Coombsa w durze wysypkowym. **[Studies on the Specificity of the Coombs' Antiglobulin Reaction in Typhus Fever]** *Archiwum Immunol. i Terapii Dośw.* Warsaw. 1959, v. 7, No. 1, 65–70. [12 refs.] English summary.

The author has investigated the specificity of the Coombs antiglobulin test for the presence of incomplete antibody to *Rickettsia prowazeki.* Titres of incomplete antibody ranging from 200 to 6,400 were found in the sera of 10 patients suffering from typhus, and negative results were obtained in tests for the presence of complete and incomplete antibodies to *Salmonella typhi* O and H, *Brucella abortus* and *Brucella tularensis.* In a similar examination of the sera of 41 persons convalescent from typhus incomplete antibody to *R. prowazeki* was present in all cases in titres of 50–400 ; 3 sera contained complete and incomplete antibodies to *Salm. typhi* and 1 contained antibodies to *Br. abortus.* The sera of 30 healthy persons gave negative results in all the tests. It is concluded that the Coombs test possesses adequate specificity in the detection of *R. prowazeki* antibody. *D. J. Bauer*

GUICHENEY, A. Un signe d'orientation précieux du diagnostic du scrub-typhus: la céphalée bitemporale. **[Bitemporal Headache, a Valuable Diagnostic Feature of Scrub Typhus]** *Méd. Trop.* Marseilles. 1959, July–Aug., v. 19, No. 4, 447–9.

From 1953 to 1954 the author treated 180 patients with scrub-typhus in Hanoï. He noticed that patients of all nationalities, when asked to point out the site of the pain, placed their hands on their foreheads and indicated with the thumb and middle finger a spot on the temple while forcibly expressing themselves with a disagreeable grimace. This pain was found to be almost exclusively bitemporal. The constancy of this sign, and the facial expression

it gave rise to, proved most valuable, when it was difficult to discern the typhus rash on a pigmented skin and often, still more so, to find the tell-tale eschar. Sometimes one could be guided by an enlarged lymphatic gland and this might give a clue to the position of the primary lesion, which once was found in a crease in the scrotum.

In some 20 cases it was impossible to find the eschar at all. Later in Pondicherry the author recognized exactly the same expression as he had seen in the typhus-stricken patients—whether these were North Africans, Vietnamese or African Negroes in Hanoï. *Philip Manson-Bahr*

KAWAMURA, A., NISHIOKA, K., AIKAWA, K. & TAKAGI, T. **Persistent Infection of *Rickettsia orientalis* (Ozeki Strain) in Ehrlich Ascites Carcinoma Cells and Effect of ED Virus upon this Host-Parasite Relationship.** *Japanese J. Exper. Med.* 1959, June, v. 29, No. 3, 167–79, 4 figs. [13 refs.]

Mice injected intraperitoneally with Ehrlich ascites carcinoma cells which had been treated with a suspension of *Rickettsia orientalis* died of carcinomatosis without showing signs of rickettsial infection. When an intraperitoneal injection of ED virus [an oncolytic virus isolated from mice] was given within 3 days of the injection of tumour cells treated with rickettsiae, all the mice died of rickettsiosis. Rickettsiae apparently persisted in tumour cells during 3 successive transplantations in mice, rickettsiosis becoming manifest after ED virus had been administered. The persistence of a rickettsial infection in the Ehrlich carcinoma system may provide an experimental model which could help in the elucidation of certain aspects of rickettsiosis. *R. S. F. Hennessey*

PHILIP, C. B. **Some Epidemiological Considerations in Rocky Mountain Spotted Fever.** *Pub. Health Rep.* Wash. 1959, July, v. 74, No. 7, 595–600.

Virulent spotted fever is mainly acquired on the west side of the Bitterroot Valley of Montana, only a few cases of the infection having been recorded on the east side. The level of tick infestation of the Columbian ground squirrel (the most numerous and important of the susceptible animal hosts of immature *Dermacentor andersoni* in the area) and other rodents is about the same on both sides of the valley, and an adequate explanation of the difference in incidence of the human disease has yet to be found.

It is thought that *Rickettsia rickettsi* may be maintained in nature by mechanisms other than (a) transovarian passage in tick vectors and (b) simultaneous feeding of infected and uninfected *D. andersoni* on susceptible hosts (mainly rodents, rabbits and hares); thus, new lines of infection in *D. andersoni* might be initiated if ticks of this species fed on rabbits or hares in areas where *R. rickettsi* was being propagated among these animals by the rabbit tick *Haemaphysalis leporis-palustris* or by *D. parumapertus*. "An average of only 1 to 3 percent of Bitterroot ticks [presumably *D. andersoni*], under varying environmental conditions, have been found to be infected in a 5-year intensive study."

Alternating tick-guineapig-tick passages (13 passages in 25 months) failed to modify the virulence of a strain of *R. rickettsi*. Attempts to infect guineapigs by applying faeces of infected *D. andersoni* to the moistened, intact or abraded

skin were unsuccessful, as were attempts to infect the rat flea *Xenopsylla cheopis*, the woodchuck flea *Thrassis acamantis*, the rabbit flea *Cediopsylla inaequalis*, and the mosquito *Aëdes aegypti*.

Observations on Rocky Mountain spotted fever may have implications where Siberian tick typhus is concerned, as these two diseases have similar aetiological and ecological features. *R. S. F. Hennessey*

Evans, A. D. & Baird, T. T. **An Interim Account of an Autumnal Outbreak of Q Fever in Cardiff.** (With a discussion on **Q Fever in Western Czechoslovakia** by L. Syrucek.) *Proc. Roy. Soc. Med.* 1959, Aug., v. 52, No. 8, 616–21 (Sect. Epidem. & Preventive Med. 28–33), 1 fig. [32 refs.]

An outbreak of Q fever affected 16 residents of Cardiff, all engaged in essentially urban occupations, during the period September–November 1958. No contact between them could be established, and none admitted contact with cattle, sheep or goats within a month of the onset of illness. The only common feature was an association, through residence, occupation or visiting, with the suburb of Rumney, which is bounded by farmland on the north and east.

Complement-fixation tests for Q fever antibodies gave positive results (titre of 1 in 16) with 1 out of 33 sera from family contacts of the 16 patients and with 3 out of 71 sera from residents of Rumney. Milk-borne infection seemed unlikely, although evidence of Q fever was found in 4·4% of cattle herds near Cardiff in 1956 [this *Bulletin*, 1957, v. 54, 20]. Biting insects, supposedly culicine mosquitoes, were very prevalent in Rumney in September 1958, and were also reported to have been abundant on local farms; it is thought that insects may have been vectors of the infection. Enquiries at the farms yielded no information of significance beyond the fact that autumn calving was common in the district.

In the ensuing discussion, L. Syrucek gave a brief account of Q fever in Western Czechoslovakia, where outbreaks of the infection have occurred since 1952, probably associated with the importation of infected sheep from Rumania. Cattle and sheep have been the domestic reservoir, and rodents, insects and birds in the vicinity of pastures have shown evidence of infection [*ibid.*, 1957, v. 54, 557]. Observations on endemic foci suggested that a decline in the prevalence of the infection among wild species (rodents and birds) was determined by a decline in the incidence of infection among domestic ruminants; this contrasts with findings in Australia and Russia, where wild life has been found infected in regions where no domestic animals were involved. Ticks were not found in the parts of Western Czechoslovakia studied, which may account for the decline of the infection among ruminants. It is suggested that Q fever can only be endemic in areas where both ticks and mammalian hosts (domestic or wild) abound. *R. S. F. Hennessey*

Collard, P. & Udeozo, I. O. K. **Serological Evidence of the Existence of Q-Fever in Ibadan.** *West African Med. J.* 1959, Aug., v. 8 (n.s.), No. 4, 137–41. [20 refs.]

Complement-fixation tests with *Rickettsia burneti* antigen on human and animal sera collected at Ibadan, Nigeria, gave the following incidence of

positive results (titre of 1 in 20): 11 out of 204 sera from male blood donors (5·4%); 1 out of 119 sera from pregnant women (0·8%); 9 out of 28 cattle sera (32%); 12 out of 27 goat sera (44%); 2 out of 11 sheep sera (18%); and 14 out of 39 fowl sera (36%).

The results indicate that Q fever is endemic in Ibadan, with cattle, goats, sheep and fowls as probable reservoirs. The higher incidence of complement-fixing antibodies among men than among women may be due to greater opportunities for men to acquire the infection when slaughtering domestic animals and fowls. Inhalation of rickettsiae is another likely mode of infection at Ibadan; 3 months of the year are dry and dusty, and a large cattle market is within the township. *R. S. F. Hennessey*

WELSH, H. H.; JENSEN, Florence W.; LENNETTE, E. H.; ABINANTI, F. R.; WINN, J. F.; KAPLAN, W. **Q Fever Studies. XX. Comparison of Four Serologic Techniques for the Detection and Measurement of Antibody to *Coxiella burnetii* in Naturally Exposed Sheep** [WELSH, JENSEN & LENNETTE]. *Amer. J. Hyg.* 1959, July, v. 70, No. 1, 1–13. [13 refs.] **XXI. The Recovery of *Coxiella burnetii* from the Soil and Surface Water of Premises harboring Infected Sheep.** [WELSH, LENNETTE, ABINANTI, WINN & KAPLAN]. *Ibid.*, 14–20, 1 fig. [12 refs.]

XX. The comparative tests reported in this paper were performed on 1,017 sera collected at intervals over a period of nearly 3 years from 113 sheep exposed to Q fever infection, 97 of which had excreted *Rickettsia burneti* at one or more parturitions. The results showed that the microscopic slide agglutination technique was markedly superior to the complement-fixation test, the standard rickettsial agglutination test and the capillary agglutination test in ability to detect antibody to *R. burneti*; the proportion of animals whose sera gave a positive result at a dilution of 1 in 8 on at least one occasion in these tests was 98%, 53%, 60% and 58% respectively. The specificity of the results obtained by the microscopic slide agglutination technique was supported by the available data on rickettsial excretion by the animals and the known opportunities for multiple exposure to infection. The sensitivity of the standard rickettsial agglutination test and the capillary agglutination test approached that of the microscopic slide agglutination test when reactions with serum dilutions of less than 1 in 8 were taken into account.

The presence of antibody detectable by any of the techniques employed did not appear to be related to the actual shedding of *R. burneti* in the placenta or birth fluids of the animal, but rather to constitute evidence of previous experience of the rickettsia.

XXI. A weekly examination of soil and water samples from 6 ranches in an area of central California where Q fever is endemic and enzootic showed that viable *Rickettsia burneti* could repeatedly be recovered from surface pools for periods of at least one month and from soil for periods up to 150 days. These recoveries were made only during the lambing season. The concentration of rickettsiae in the soil would favour infection of man and livestock by "secondary (dust) aerosols" in the absence of active shedding of the organisms by infected animals. *R. S. F. Hennessey*

TJALMA, R. A. & BRAUN, J. L. **Application of the Luoto Capillary Agglutination Milk Test to the Study of Bovine Q Fever.** *Amer. J. Pub. Health.* 1959, Aug., v. 49, No. 8, 1025–31, 6 figs. [20 refs.]

"The Luoto capillary agglutination milk test [this *Bulletin*, 1955, v. 52, 891] is demonstrated to be a reliable and valid method of identifying Q fever infected dairy cows. The testing of pooled herd milk specimens is discussed as a rapid, efficient, and economical procedure for surveying bovine populations for evidence of Q fever infection and identifying individual infected herds. Infected cows are demonstrated to produce both negative and positive milk as a function of the individual udder quarters. The implications of this observation are discussed."

POSPÍSIL, R. & RYCHLO, A., with the technical assistance of E. VRANAYOVA. Dynamika tvorby komplement viažúcich protilátok po intranazálnej infekcii morčatà pôvodcom Q horúčky. [**Course of Production of Complement-Fixing Antibodies after Intranasal Infection of Guineapigs with the Agent of Q Fever**] Reprinted from *Sbornik Prác Lekárskej Fak. Univ. Komenského v Košiciach.* 1958, v. 1, 203–10. [38 refs.]

The authors have investigated the course of production of complement-fixing antibody in 23 guineapigs infected intranasally with the Henzerling strain of *Rickettsia burneti*. Signs of infection appeared after 3–5 days, and the disease reached its maximum severity after 7–8 days. Antibody could not be found on the 8th day, and was present in low titres (16–32) in only 4 animals on the 10th day; on the 12th day all animals had developed antibody, and the titres rose thereafter to attain a maximum of 64–512 on the 21st day. *D. J. Bauer*

RYCHLO, A. & POSPÍSIL, R., with the technical assistance of V. SIDOROVA. Patomorfológia experimentálnej Q horúčky morčatà po intranazálnej infekcii. [**Pathomorphology of Experimental Q Fever of the Guineapig after Intranasal Infection**] Reprinted from *Sbornik Prác Lekárskej Fak. Univ. Komenského v Košiciach.* 1958, v. 1, 53–67, 8 figs. [28 refs.] English summary.

The authors have investigated the histopathology of infection with the Henzerling strain of *Rickettsia burneti* in guineapigs inoculated intranasally. 2 of 24 animals died on the 10th and 14th days of infection; in the remainder a rise of temperature occurred after 4 days and was followed by recovery after 9 days. Autopsy carried out at the height of infection revealed focal pneumonia, enlargement of the spleen and lymph nodes and dilatation and hypertrophy of the heart. On microscopical examination the lungs showed acute interstitial pneumonia with abundant infiltration with vacuolated histiocytes. Rickettsiae could be demonstrated in the histiocytes in the lungs and also in the lymph nodes and spleen. *D. J. Bauer*

RABIES

CONGIU, S. & SOBRERO, L. Virus fisso della rabbia in Somalia. **[Fixed Rabies Virus in Somalia]** *Ann. Soc. Med. Igiene Trop. Somalia.* 1954–8, v. 2, 113–25.

The English summary appended to the paper is as follows:—

"The causes for the spread of canine rabies in Somalia are discussed, and the fact is attributed to circumstances connected with the war (to the uncontrolled importation of dogs with the troops), to the unchecked increase of the canine population and to the failure to observe the most elementary rules of hygiene and sanitation.

"A description is given of the work carried out during the last four years in the Istituto Sierovaccinogeno of Merca, Somalia, to favour preinfection vaccination. The tests carried out clearly show that the virus provided by the Instituto Antirabico, Rome, has not during the last four years undergone any appreciable modification, is very efficient for the preparation of vaccines and is perfectly well adapted to the central nervous system."

PALMER, A. W. **Rabies: with particular reference to the Laboratory Diagnosis.** *J. Med. Lab. Technol.* 1959, July, v. 16, No. 3, 210–17.

"1. The development of the Flury attenuated chick embryo vaccines is one of the greatest advances made in the field of rabies vaccine since the days of Pasteur. Excellent results have been obtained in the treatment of human beings with the use of concentrated hyperimmune serum prepared in horses and ultra-violet inactivated brain tissue vaccine.

"2. Details are given of the laboratory techniques used in the Veterinary Laboratory, Blantyre, for the diagnosis of rabies.

"3. The seriousness of the disease in Nyasaland is indicated by the following statistics of incidence:—

"Of 147 brains examined in 1956, 90 were positive for rabies as shown by histological and/or biological examination. The species distribution of the 90 cases were as follows:—

Dogs	74
Cats	1
Sheep	1
Cows	4
Foxes	1
Bulls	1

317 courses of rabies vaccine were given to humans for anti-rabies treatment in the same year.

"The following figures for other African territories will help one to appreciate how the menace of rabies is forever present:—

S. Rhodesia, 1954	184 cases
S. Rhodesia, 1955	100 cases
Uganda, 1955	37 cases
N. Rhodesia, 1955	128 cases
Union of S. Africa	68 cases."

SULKIN, S. E., KRUTZSCH, P. H., ALLEN, R. & WALLIS, C. **Studies on the Pathogenesis of Rabies in Insectivorous Bats. I. Role of Brown Adipose Tissue.** *J. Exper. Med.* 1959, Sept. 1, v. 110, No. 3, 369–88. [50 refs.]

A strain of street rabies virus isolated from human brain in its second mouse passage was used. Mexican free-tailed bats (*Tadarida mexicana*) were used on the day they were netted. Little brown bats (*Myotis lucifugus*) were usually inoculated 2 days after collection. Handling was facilitated by cooling the animals for a short period at 4°C. The animals were inoculated either intramuscularly or into the surgically exposed interscapular brown fat.

In intramuscularly inoculated *Tadarida*, virus was demonstrated in the brown fat in 16–34% (log titres in mice 1·5 to 3·0), in the salivary glands in 31–39% (titres 2·5 to 3·0) and in the brains in 80–93% (titres 2·4 to 3·5). Virus was widely distributed in the animals between 20 and 40 days and sometimes 60 days after inoculation. Titres tended to be higher in animals found dead or showing symptoms.

In the *Myotis*, a deep hibernator, the brown fat is a well-defined structure and more abundant than in *Tadarida*. In *Myotis* inoculated intramuscularly, virus was found in the brown fat in 26%, the salivary gland in 11% and in the brain in 91% ; inoculated into the brown fat, virus was found in 38%, 25% and 96% respectively. The titres in these tissues were 1·5–4·3, 1·5–3·5, 1·5–4·8 respectively.

The Syrian hamster was used in further studies as it has interscapular brown fat and may hibernate. After intramuscular inoculation the animals had virus in the brown fat in 63%, the salivary gland in 23%, the brain in 91–100% and virus was also demonstrated in muscle and kidney in some animals. Titres were 1·5–4·3 in brown fat, 2·3–4·0 in salivary gland, 3·5–5·0 in brain, 2·5–4·0 in muscle and 1·5–2·3 in kidney. *C. E. Gordon Smith*

PLAGUE

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, rodent hosts, transmission, pathology, diagnosis, clinical findings, treatment, control.

GRAINGER, W. E., HEISCH, R. B. & NELSON, G. S. **Rodent Plague in Nyeri District of Kenya.** *J. Trop. Med. & Hyg.* 1959, Sept., v. 62, No. 9, 211–12, 1 map.

In 1953 HEISCH *et al.* recorded the presence of wild rodent plague in the Rongai area of Kenya [this *Bulletin*, 1954, v. 51, 264]. The authors now record another focus in the Kikuyu reserve, south of Nyeri, in which hilly area sporadic plague has been known for many years. This new focus is west of the Sagana river and extends to the Aberdare mountains. 13 cases were diagnosed in August–September 1958, mostly from 3 villages (shown on a map). The outbreak was controlled rapidly with the use of DDT dusting powder.

Several wild rodents were caught in one location, Mahiga, near the village of Kagere. Pooled spleens and fleas were inoculated into guineapigs, and

Pasteurella pestis (var. *antiqua*) was isolated from *Otomys angoniensis* (the predominant rodent) and from the flea *Dinopsyllus lypusus*; this flea was present in smaller numbers on rodents than was *Ctenophthalmus cabirus*, although *D. lypusus* is probably an important vector and *C. cabirus* is unlikely to be of epidemiological importance.

Tables show the findings in 7 species of rodents and 5 of fleas. In 462 *Rattus rattus* (from a village further north which had not been treated) no *P. pestis* were found. The predominant flea on *Rattus* was *Xenopsylla brasiliensis* (299) and no *X. cheopis* were found on this rat, and indeed only 5 *X. cheopis* were found on all the rodents. In the Rongai focus, *X. cheopis* predominated in *Rattus* and furthermore *Arvicanthis abyssinicus*, an important reservoir at Rongai, was not found in the present focus. However, *O. angoniensis* and *D. lypusus* had also been found infected at Rongai.

Although it seems likely that wild rodents are the principal permanent reservoir of plague in East Africa this has not been proved. The authors suggest that with modern pooling techniques attempts should be made to isolate *P. pestis* from the domestic rat *R. rattus* and its fleas during interepizootic periods: until this has been done on a large scale in East Africa and elsewhere it cannot be decided whether *R. rattus* can act as a permanent reservoir of plague. *H. J. O'D. Burke-Gaffney*

Jervis Alarcón, O. La peste bubónica: problema de urgente resolución. [**Bubonic Plague, an Urgent Problem**] *Rev. Ecuatoriana de Hig. y Med. Trop.* Guayaquil. 1958, July–Sept., v. 15, No. 3, 105–37, 4 charts & 1 map. [23 refs.]

This paper is concerned with plague in Ecuador. A chart shows the annual number of cases from 1939 to 1956. A sharp drop from 450 cases in 1939 to about 60 in 1940 is then maintained at, or below, about 100 per year. In 1908, at the port of Guayaquil, the disease was introduced from Peru. The disease had been brought into Peru in 1903 through shipments from India. Cases then occurred widely in coastal Ecuador over the years. From 1930 to 1935 the disease disappeared in this region but it recurred again in that year in Guayaquil. Control was again established by 1940. After the initial introduction, in 1908, the disease penetrated into, and became widely distributed in, the mountainous interior. Loja province, contiguous with Peru [this *Bulletin*, 1940, v. 37, 824], and central Chimborazo province became and remain the principal foci, with Loja most severely affected. [The topography of these provinces is briefly described and differences noted.] In general, plague has been associated in this country with (1) ports and towns on the coast, (2) towns along railway routes, (3) rural, inland mountainous country. In the last it is endemic, associated with infection in wild rodents and particularly difficult to contain. There is a good deal of information in two sections on the domestic and wild rodents and their ectoparasites.

The bulk of the paper is concerned with separate accounts of the incidence and ecology of the disease, and on actual or proposed measures for the control of plague in Loja, Chimborazo and some other inland provinces and in the coastal zone. Administration and organization are discussed at some length. *D. S. Bertram*

Dodin, A. & Brygoo, E. R. Étude quantitative de l'utilisation des sucres par *Pasteurella pestis* souche E. V. en suspension non proliférante. I. Le rhamnose. **[Quantitative Study of Glucide Uptake by *Pasteurella pestis* EV Strain, in Non-Proliferating Suspensions. I. Rhamnose]** *Ann. Inst. Pasteur.* 1959, Aug., v. 97, No. 2, 245–7, 1 chart.

The EV strain of plague bacillus was isolated in Madagascar and is characterized by its rapid fermentation of rhamnose, but rhamnose-negative strains occur. A rhamnose-negative strain grown on peptone agar was found to utilize glucose to the extent of about 90%. With a rhamnose-positive strain grown on a medium free from rhamnose there was about 45% utilization of rhamnose and about 75% utilization of glucose. When, however, a rhamnose-positive strain was grown on a medium containing rhamnose, 92% of the rhamnose was utilized, but it would seem that adaptation to rhamnose induces a reduced capacity for glucose utilization. *H. J. Bensted*

Voelckel, J. & Varieras, G. La répartition des espèces *R. norvegicus* et *R. rattus* à Douala. **[Distribution of Species of *Rattus norvegicus* and *R. rattus* at Douala, French Equatorial Africa]** *Méd. Trop.* Marseilles. 1959, July–Aug., v. 19, No. 4, 456–9.

This paper extends to 1958 the observations made in 1956 and the beginning of 1957 on the distribution of rats in Douala [this *Bulletin*, 1959, v. 56, 43]. It sets out the findings in tables with similar detail, and from these it is evident that the increasing prevalence of *Rattus norvegicus* is a real one. The incidence of *R. norvegicus* in Douala, apart from Bonaberi, was 97·1% in 1958 compared with 92·7% for the whole year 1957; the corresponding figures for Bonaberi were 78·6% and 50% *H. J. O'D. Burke-Gaffney*

Stark, Harold E. [B.A., M.S.] **The Siphonaptera of Utah. Their Taxonomy, Distribution, Host Relations, and Medical Importance.** pp. xiii + 239, 126 figs. & 5 maps. 1958. Atlanta: U.S. Dept. of Health, Education & Welfare, Public Health Service, Bureau of State Services, Communicable Disease Center, Georgia.

The first and only satisfactorily confirmed case of human plague in the State of Utah, U.S.A., was in a child bitten by a squirrel in 1936. Epizootics in native rodents were, at the time, being studied and this work, particularly since 1948, has been extended and intensified by various organizations. A brief outline of these developments is followed by short accounts of the topography and climate of the State and some general problems in flea distribution related to these circumstances. A useful, illustrated, chapter describes methods for finding and catching fleas and their wild animal hosts; also mounting techniques.

In a general consideration of the medical and economic aspects of fleas in Utah, emphasis is placed on plague. *Brucella tularensis* has also been isolated from a rodent flea in Utah; but not murine typhus. Several domestic species of flea are biting nuisances, and the usual veterinary aspects of fleas are noted. As regards plague, infection in wild animals or in their fleas has been proven on only 17 occasions in extensive, state-wide survey. All are from the central

north-south mountains, usually over 6,000 ft. Direct contact of man with native animals or their fleas is considered the means by which plague in man may occur again in Utah. But the possibility of its being derived through domestic rodents and their fleas is not wholly discounted. The author is not in favour of terms such as sylvatic, campestral, rural or urban plague, but seems not to have escaped entirely their generally descriptive convenience.

There is a concise summation of recent writings on ways of assigning indices of vector efficiency to flea species. About 80% of the publication is on the systematics of fleas, with nearly 200 fine illustrations of parts of fleas supporting keys to 115 species. A list of species embodies a notation at once indicating whether a species has been proved naturally infected with plague or, experimentally, susceptible and capable of transmitting plague. Under each species in the general text there is synonymy, a record of type locality and host, and location of types. The medical interest is well summed for each species, where this is relevant. Wild animal plague findings are mapped, and 4 other maps show the known distribution in Utah of species of *Thrassis*, *Opisocrostis*, *Diamanus montanus* and *Cediopsylla inaequalis*. The last species appears free from implication in plague but involves subspeciation problems. The others are among about 40 species found naturally infected, and for not a few of which indices of vector efficiency have been derived experimentally.

Host-flea associations are discussed briefly and summarized in a final chapter, in part by a table. References number nearly 300. *D. S. Bertram*

CHOLERA

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.

See also p. 91, LEARMONTH & PAL, **A Method of Plotting Two Variables (such as Mean Incidence and Variability from Year to Year) on the same Map, using Isopleths.**

i. CHATTERJEE, S. K. & DAS GUPTA, A. **"Cholera in Calcutta." Some Observations of Epidemiological Interest and the Problem of its Control.** *Indian J. Pub. Health.* 1959, Jan., v. 3, No. 1, 5–19A, 3 sketches, 3 graphs & 1 coloured diagram.

ii. ABOU-GAREEB, A. H. **Some Epidemiological Observations on Cholera in Kathmandu, Nepal.** Ibid., 20–32, 1 map, 4 figs. & 8 diagrams. [18 refs.]

iii. ROY, D. K. **A Note on the Incidence of Cholera in the Chetla Area (Wards 71 & 72) for the Period between November 1957 to June 30, 1958,** *Ibid.*, 33–7, 1 diagram & 1 map.

The three papers reviewed here are concerned with the epidemiology of cholera as experienced in Calcutta and in Kathmandu.

i. Over the period 1956–58 an annual average of 10,823 patients was admitted to hospital in Calcutta suspected of cholera. In fact only 15·8% of 16,756 stool examinations from these patients were vibrio-positive. The greatest prevalence was found in the slums of Central Calcutta. Cholera was endemic throughout the year but reached a peak in the second quarter when religious

festivals occurred. Cholera vibrios could be isolated from the Hooghly River, especially at times when the flow was low, but not from tanks or lakes. There was a domestic piped water supply of filtered chlorinated water augmented from tube wells, but this was not available all day and the distribution pipe lines were old, cracked and liable to contamination. For non-domestic purposes polluted water from the Hooghly was provided. One-third of the city had no sewerage and flies abounded.

It is concluded that when safe water is scarce people occasionally use the non-domestic supply in which vibrios are sometimes present. Flies spread infection from the cases resulting. Recommendations are made for the control of the disease based on this investigation, including improved water supply, sewerage, slum clearance and abolition of dual water supply. Since these are long-term proposals interim measures suggested include mass inoculation of the communities at greatest risk before the epidemic season and every 6 months thereafter, augmentation of the safe water supply with its chlorination to a level providing a proved residual content at the supply points, unfiltered water to be made inaccessible or to be purified, sanitary disposal of wastes, health education enforcement of the bye-laws concerning food and the provision of an organization to carry out these proposals.

ii. Outbreaks of cholera have occurred annually in Nepal but the 1958 epidemic in Kathmandu is the first to be bacteriologically confirmed and reported internationally. Sources of infection were the nursing of patients in hospital by relatives who remained in contact with susceptible persons outside, discharge of patients before cure owing to pressure of demand for hospital beds, and the carriage of moribund patients to riverside *ghats* where vomit and stools were washed away with river water. Foodstuffs suspected of conveying infection were milk-curds exposed to flies, and chillis dried on contaminated soil and handled frequently. Shallow wells were the probable cause of foci of infection around them. It is claimed that Kathmandu is an endemic area of cholera, because over 17 years the average period without cholera cases was 2·65 months per year.

iii. In the two wards of Calcutta served by the Chetla Health Centre there were during the 7 months ending June 1958, 198 cases regarded as cholera of whom 17 were proved bacteriologically. The bustees contributed 53% of the cases. Multiple cases in families only occurred in 15 of 171 patients. Permanent residents showed a lower mortality than others, possibly because of partial immunity. None of the patients drank anything but piped water, but 20·5% used unpurified water for other purposes. Surface waters were obviously polluted and cholera vibrios were grown from Tolly's nullah 7 times in 41 examinations. As a result of a survey, mostly in the bustee area, it was estimated that cholera was under-reported by 25%. *T. H. Davey*

ABOU-GAREEB, A. H. **Cholera Vibrios in Calcutta Mosque Water.** *J. Trop. Med. & Hyg.* 1959, Aug., v. 62, No. 8, 195–7, 1 fig.

This paper is concerned with the bacteriological examination of the waters of the ritual ablution tanks of the Nakhoda Mosque in Calcutta. Specimens collected on the Friday morning before the arrival of the congregation for the prayers failed to reveal the presence of cholera vibrios on each of the four occasions of the tests reported here, the first of which was on 27th February

1959. In all cases, however, specimens from the tanks collected later in the day, shortly after the ritual ablutions of all those attending the religious service had taken place, revealed the presence of *Vibrio cholerae*.

These important observations were well controlled. The technique involved the culture of the complete filter-pad, after the filtration of 1 litre of each test water, in an enrichment medium followed by plating on differential media, selection of colonies and subsequent biochemical, serological and haemolytic tests. Of the four positive isolations, one culture proved to be *V. cholerae* Inaba and the others to be *V. cholerae* Ogawa.

No detailed epidemiological studies are reported in this paper, but the author did interrogate a number of Moslem patients at the time who were suffering from cholera. Of 27 interrogated he found that 12 were at risk under the general terms of the enquiry and that 3 had prayed at the particular mosque within 6 days of going sick with acute cholera.

While it is obvious that the infectivity of the tank water was due to very recent, in fact immediate in time, pollution from excreters of *V. cholerae*, it was not possible to say whether these were precocious excreters or convalescent excreters; either type was feasible. [Bengal is generally regarded as the most important endemic centre of cholera. In Calcutta, for instance, the infection does not die out at the end of the epidemic season. Although the incidence is much reduced cases continue to appear during the cooler period and these interesting observations point to one method through which spread of infection may continue.] *H. J. Bensted*

KHUDANOV, L. E., SHKURKO, E. D. & MIKHNO, V. S. **The Serological Relationship between *Vibrio comma* and *Brucella*.** *J. Microbiol., Epidemiol. & Immunobiol.* London. 1958, v. 29, No. 12, 1974–5. [Translated from Russian.]

"(1) An examination of blood from serum-producing horses and rabbits immunized with *V. comma* antigen showed that the sera agglutinated both *V. comma* (at higher titres) and *Brucella* (at much lower titres).

"(2) There was a parallel fall in the titres of cholera and brucellosis agglutinins during periods of rest in the production of cholera antisera by horses.

"(3) A positive agglutination reaction with *Brucella* antigen in horses producing cholera antisera does not justify their disposal as suffering from brucellosis."

AMOEBIASIS AND INTESTINAL PROTOZOAL INFECTIONS

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.

MAYTHAR, Z. & SCHNEUR, Rachel. **[Laboratory Diagnosis of Trophozoites of Amoebae of Man]** *Dapim Refuiim*. Tel-Aviv. 1959, Aug., v. 18, No. 3 [in Hebrew 168–72, 3 figs. on pl. English summary v].

"Attention is drawn to the procedure of adding few drops of cold Schaudinn fixative solution to wet mount preparations from feces and cultures of amebae;

the structure of the nuclei in the trophozoites of Ent. histolytica and E. coli (their cysts as well) are made thus rapidly visible.

"The nuclei of Dient. fragilis or Endol. nana are not affected. 10 minutes of Giemsa staining of a dried, alcohol fixed, preparation, helps in the prompt identification of Dient. fragil. binucleated forms.

"Some statistical data of new cases of amebiasis in Kupat-Cholim in years 1936–56 are given as an indication of the infestation of the population."

KUM YON KON. **The Immunological Diagnosis of Amoebic Dysentery.** *J. Microbiol., Epidemiol. & Immunobiol.* London. 1958, v. 29, Nos. 1/2, 88–94. [Translated from Russian.]

Immunological tests for amoebiasis so far have been unsatisfactory; this probably is because the antigens used have been inadequate. The author, in Korea, selected stools from normal persons free from amoebae and from dysentery bacilli, and stools containing numerous amoebae but no dysentery bacilli, for the preparation of control and of specific antigens. 1 ml. of faeces was emulsified in each of a number of tubes containing "universal borate-phosphate-citrate buffer" solutions of *p*H ranging from 2·0 to 8·0; after heating and periodically agitating for an hour at 100° [? C.] the suspensions were left at room temperature for 12 hours. The supernatant fluids were then filtered through asbestos, and the *p*H value of each adjusted to 7·0 by adding 1% NaOH or HCl solutions; if floccules formed these were removed by filtration. These fluids were used as antigens. Some antigens extracted with acetone or alcohol were also prepared from the initial suspensions.

Ring precipitation tests showed that the sharpest results were obtained with antigens prepared by extract from faeces with buffer solution at *p*H 4·0 or *p*H 3·0. The antigens so prepared from normal faeces free from amoebae caused no precipitate formation with the sera of healthy persons or those of amoebic dysenteric patients. Those prepared from amoebic dysenteric stools produced precipitation with sera from amoebic dysenteric patients, but not with sera from control healthy persons. The antigens extracted with acetone or alcohol and prepared from amoebic stools produced precipitation irregularly with sera from amoebic dysenteric patients but the results were neither consistent nor specific. These latter types of antigen were therefore abandoned, and attention was concentrated on antigens prepared by extraction with buffered solution at *p*H 4·0.

Tests with antigens made from the stools of 15 amoebic dysenteric patients (9 passing amoebae, and 1 cysts) against the sera of each of them showed that the sera of those who had had active amoebic dysentery for a long time (3 months and more) gave marked precipitation with the majority of the antigens. The sera of the only 2 patients who had had the disease for short periods (8 and 11 days respectively) gave a negative result with nearly every antigen, in one case with that prepared from his own faeces. Though all these antigens appeared to be specific their sensitivity varied, some being relatively weak.

Having found patients with sera consistently giving strong precipitates with active antigens, the author prepared further antigens from stools more highly charged with amoebae and the most effective were selected after test with the known positive sera. Sera from 164 patients suffering from various forms of colitis were tested against these. The results were positive in 34 (80·9%) of

42 patients with amoebic dysentery; the test was negative in all but one (3·7%) of 27 cases of bacillary dysentery. In 53 patients with colitis of unknown or not established aetiology the test was positive in 7 (13·2%).

This same antigen was heated to 100° [? C.] for 3 successive days to sterilize it; after neutralization with 1% NaOH, penicillin was added to the extent of 100,000 units per 10 ml. For skin testing 0·1 ml. was injected intradermally, with an injection of a similarly prepared control antigen at 10 cm. distance. After 4 hours erythema of not less than 10 mm. in diameter, and at least 10 mm. greater than that produced by the control antigen, was considered to be a positive reaction. 38 patients with amoebic dysentery were so tested; 30 (78·9%) of them gave positive skin reactions. Results with patients having bacillary dysentery or non-specific colitis were comparable with those which had been obtained in the precipitation tests. Of 33 patients with amoebic dysentery examined by the skin test and also by the precipitation test 19 gave positive readings to both; in 9 the precipitation test alone was positive; in 4 the skin test alone was positive; in one case only were both negative. In 44 patients with non-amoebic colitis the precipitation test was negative in all, but the skin test was positive in 3. The latter test is therefore less specific than the former.

[The only references cited are 2 papers by Craig (this *Bulletin*, 1930, v. 27, 391; 1931, v. 28, 262).] *A. R. D. Adams*

Woodruff, A. W. **Amoebicides.** *Practitioner.* 1959, July, v. 183, No. 1093, 92–8.

This contribution to "current therapeutics" is a simple and sound summary of the modern treatment of amoebic dysentery and of amoebic liver infection. It contains no new contribution to the subject, but is notable in its advocacy of emetine bismuth iodide [EBI] for the ultimate eradication of the intestinal infection—a view with which most British workers will agree. The opinion is expressed that concurrent treatment with other amoebicides does not increase the high cure rate (over 95%) obtained with EBI given alone for a period of 10 days; therefore this additional treatment is superfluous. While EBI is still the best available drug for its purpose it is increasingly being challenged by the new synthetic amoebicides of which diloxanide (Entamide) shows the greatest promise, particularly in absence of toxicity. *A. R. D. Adams*

Pezzullo, C., Tedeschi, G. & Tedeschi, L. M. Comportamento del glicogeno cardiaco, epatico e muscolare nell'intossicazione emetinica sperimentale. **[Cardiac, Hepatic and Muscular Levels of Glycogen in Experimental Emetine Poisoning]** *Acta Med. Italica.* 1958, Nov., v. 13, No. 11, 281–3. [11 refs.]

Pezzullo, C., Tedeschi, G. & Brancaccio, G. La proteina C reattiva nell'intossicazione emetinica sperimentale. **[C-Reactive Protein in Experimental Emetine Poisoning]** *Acta Med. Italica.* 1958, Oct., v. 13, No. 10, 253–4.

PRUSS, J. Züchtungsmethode von *Entamoeba muris* bei einer Temperatur von 37°C. [**Cultivation of *Entamoeba muris* at 37°C.**] *Ztschr. f. Tropenmed. u. Parasit.* Stuttgart. 1959, Apr., v. 10, No. 1, 30–36. [21 refs.]

The author notes that previous attempts to cultivate the murine parasite, *Entamoeba muris*, have produced conflicting results. Having failed to grow this amoeba on media devised by SIMITCH and PETROVITCH, DOBELL and LAIDLAW, and WESTPHAL, he developed a new diphasic medium in which satisfactory growth was obtained. The solid phase of this medium consists of horse serum which is allowed to coagulate at 70°C. for 1–2 hours in test-tubes (5 ml. per tube) lying at an angle, to permit the formation of slopes. The fluid component is prepared by adding to 500 ml. of Ringer's solution the white of one egg and shaking 100 ml. of the mixture for 30 minutes at 100°C., after which 150 ml. each of Ringer's solution and distilled water are added, and the mixture is again heated for 30 minutes at 100°C. The resulting mixture is filtered and stored in a refrigerator. The final culture medium consists of the serum slope and 1–2 ml. overlay, to which are added 3–5 drops of penicillin solution (50,000 units in 34·8 ml. distilled water) and about 0·01 gm. rice powder.

Rat strains of *E. muris*, inoculated into this medium, were grown at 37–38°C., with daily subcultures. In this manner the amoebae were maintained *in vitro* for about 6 months, their numbers increasing considerably from the 14th day onwards. The cultures inoculated intracaecally into rats were infective to these animals only up to the 94th passage. Similar results were obtained with *E. muris* from mice, but no growth was obtained with a strain isolated from hamsters, on account of which the author doubts whether the hamster amoeba is identical with *E. muris*. Negative results were also obtained with *E. histolytica*, which failed to develop in the new medium. *C. A. Hoare*

DE CARNERI, I. Nuove osservazioni su *Balantidium coli*. I. Diffusione tra i suini a Milano, coltivazione, sensibilità ai farmaci *in vitro*. [**New Observations on *Balantidium coli*. I. Occurrence among Pigs in Milan, Cultivation, and Response to Drugs** *in vitro*] *Riv. di Parassit.* Rome. 1959, Mar., v. 20, No. 1, 9–28. [Numerous refs.]

After a thorough critical review of the literature on the occurrence of *Balantidium coli* in different countries, with special reference to the relationship between porcine and human balantidiosis, the author describes his own observations on the incidence of balantidial infection in Milan, on the cultivation of this ciliate and on the effect of drugs upon it.

While the total number of human cases reported from Italy does not exceed 30, the incidence of infection in pigs appears to be high. As in the case of *Entamoeba histolytica*, it was shown that in some cases *Balantidium* can lead a commensal existence in the lumen of the human gut without producing clinical symptoms, while in others it invades the intestinal wall, though in Italy no fatal cases have been reported. Examinations of the caecal contents of 212 pigs from the Milan slaughterhouse revealed balantidial infection in 94·8% of the animals. Trials with various culture media showed that *Balantidium* could not be isolated in monophasic media but grew readily in a modification of the Dobell-Laidlaw diphasic medium, consisting of a coagulated

serum slope overlaid with Pavlova's medium, in which serum was substituted by egg white, and rice powder was added. However, in subsequent subcultures the ciliates could be grown in a monophasic medium. *In vitro* tests of 17 drugs, including antibiotics, upon ciliates, grown in Pavlova's monophasic medium at 37°C., showed that emetine had the most effective balantidicidal action.

This paper is provided with numerous references.

[See also this *Bulletin*, 1959, v. 56, 536.] *C. A. Hoare*

RELAPSING FEVER AND OTHER SPIROCHAETOSES

SARASIN, G. Zum Organotropismus der Spirochaete *B. duttoni* gegenüber der übertragenden Zecke. [**The Organotropism of the Spirochaete** *Spirochaeta duttoni* **inside the Transmitting Tick**] *Acta Tropica*. Basle. 1959, v. 16, No. 3, 218–43, 3 figs. [21 refs.]

The author has made a detailed study *in vitro* of the tropism of the relapsing fever spirochaete, *Sp. duttoni*, towards various organs of *Ornithodorus moubata*, following up BURGDORFER'S observations [see this *Bulletin*, 1952, v. 49, 512]. The organs of the tick to be tested were introduced into capillary tubes of appropriate length and suspended in coxal fluid.

The blood from an infected mouse was mixed with solution TC199 in a sterile glass container and allowed to stand for some minutes until the erythrocytes had settled to the bottom, when the spirochaetes were found to form a layer immediately above them. The open end of the capillary tube containing the organ to be tested was then lowered into this layer and the behaviour of the spirochaetes followed under the microscope. It was found that these organisms kept to a particular layer and only travelled backwards and forwards. After being exposed to the stimulus of certain organs of the tick they swim towards them, and, on coming into contact with firm tissue, force their way into the intercellular spaces. They only become intracellular in the oöcytes.

The author was unable to arrive at a definite conclusion concerning any multiplication of spirochaetes in the tissues, but there were marked differences in their density in different organs. The ganglia and coxal glands were the most attractive organs, as compared with the salivary glands, ovaries, testes and Malpighian tubules.

The organotropism seems to be due to a substance secreted from the tissues, and spirochaetes do not always react to it in the same way. It is affected by marked barometric falls and also by seasonal variations but the fluctuations are proportional for all organs. The duration of latency before the substance exercised any attraction, and also the maximal distance of attraction, were used by Professor GRUEN of the Institute of Physical Chemistry, Basle, to calculate the molecular weight of the secreted substances. The results showed a correspondence with the data obtained from oligosaccharides such as glucose.

Edward Hindle

LEPROSY

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.

OUAZZANI, A. Remarques historiques et épidémiologiques de la lèpre au Maroc. **[Historical and Epidemiological Observations on Leprosy in Morocco]** *Maroc Méd.* 1959, Sept., v. 38, No. 412, 1329–30.

The origins of leprosy in Morocco are buried in antiquity. It is believed to have been introduced among the original Berbers in turn by the Phoenicians, the Hebrews, and the Arabs. It was at its height in the XIVth century with the influx of Moslems and Jews from Spain; and although it does not now reach such proportions it continues to smoulder in latent form.

There are two great areas of endemicity. The first, in the north, is situated in the Sebou basin in the neighbourhood of the Fès-Taza region. The areas mostly affected are along the Ouergha and Inaouen valleys, where the disease exists among different tribes with an endemicity up to 1 per 1,000. Another highly endemic focus is to be found among the Beni Sadden tribe of Berbers: this is not far from Fès, has been recently introduced and is one of the most active foci in the area.

The second main area is in the south-west in the Oumer Rebia basin and extends from the Mazagan to the Marrakesh regions; there are some highly endemic foci, with incidences of up to 1 to 2 per 1,000.

There is a third area of moderate endemicity in the heart of the Middle Atlas region, joining the other two.

The Berbers are more frequently infected than the Arabs and Jews who originally contributed in introducing the disease. Poor living conditions and particularly overcrowding contribute to this.

These conditions have stimulated the development of a campaign for early diagnosis of leprosy, examination of suspected cases and contacts, protection of children, and social assistance. Education and raising of living standards are especially needed. *H. J. O'D. Burke-Gaffney*

SCHMIDT, H. **Reactivity of a Lecithin-Free Cardiolipin Preparation (Cardchol) in Leprosy Sera.** *Bull. World Health Organization.* Geneva. 1959, v. 20, No. 6, 1175–91. [32 refs.]

Leprosy sera are notoriously liable to give false positive reactions for syphilis with lipoidal antigens; when lecithin is absent from a "normal" cardiolipin antigen as in "cardchol" (which is a mixture of cardiolipin and cholesterol) [*Bull. Hyg.*, 1959, v. 34, 885] the resulting antigen is much more likely to give a positive result than a "normal" antigen. This effect of the absence of lecithin has been demonstrated by a number of authors whose results are set out.

The present author examined 161 sera from leprosy patients of whom 101 had lepromatous (mixed, cutaneous) and 60 neural (tuberculoid, nervous) types of the disease. Various other tests including Kahn, VDRL, Meinicke and Kolmer tests and also TPI tests were carried out both in Egypt whence the sera were obtained and in the author's own laboratory.

When an ordinary complement-fixation test using "normal" cardiolipin antigen (CWRM) [*Bull. Hyg.*, 1954, v. 29, 1047] was compared with one using

cardchol, in lepromatous leprosy the former gave 15% and the latter 64% positive reactions; in neural leprosy the respective figures were 3% and 22%. As regards duration of disease those with shorter periods were more reactive than those with longer, as occurs in syphilis.

In order to find out what elements in the sera were most reactive with cardchol an electrophoretic investigation was carried out; it was found that the CWRM was non-reactive with all fractions whereas cardchol reacted chiefly with the gamma globulin and gamma and beta and alpha2 globulins. Thus it seems that cardchol would be helpful in distinguishing false positive sera due to leprosy from syphilitic sera. *T. E. Osmond*

SILVA, C. & TUMA, M. Reação leprótica e hormônios corticosteroides. (Algumas informações fornecidas pelo laboratório.) **[Lepra Reaction and Corticosteroid Hormones. (Some Information furnished by the Laboratory)]** *Bol. Servico Nac. de Lepra.* Rio de Janeiro. 1959, Mar., v. 18, No. 1, 24–32.

The authors describe the results of the application of the Thorn test in lepra reaction. The test consisted in injecting intramuscularly 25 units of corticotropin twice a day for 4 days, counting the eosinophil cells morning and evening, and noting changes in the amount of 17-ketosteroids and corticosteroids in the urine. In 2 leprosy patients, one not subject to leprosy reaction and one subject to severe reaction, the results were similar in both and corresponded to those seen in normal persons.

The authors then studied the elimination of these 2 substances in the urine in a lepromatous patient before there were any signs of reaction, during a reaction, and during convalescence after a reaction. They noted that 17-ketosteroids were eliminated normally before reaction, slowly and progressively during the reaction; and that they increased in amount during convalescence. The corticosteroids varied slightly in their amount during the period of observation. The authors consider that this method should be used further in investigating the pathology of lepra reaction. *Ernest Muir*

RAMU, G. **A Preliminary Trial of Chloroquine Diphosphate in Lepra Reaction.** *J. Indian Med. Ass.* 1959, Aug. 16, v. 33, No. 4, 127–9.

Treatment was given to 8 lepromatous patients suffering from lepra reaction, the dose of chloroquine diphosphate being 0·25 gm. thrice daily by mouth for the first week, followed by 0·25 gm. twice daily for another 2 weeks. All the patients recovered from the reaction in periods varying from 4 days to 2 weeks.

From these results it is concluded that chloroquine is useful in controlling lepra reaction and particularly useful because of the ease of administration and low toxicity. It is at least worthy of further trial. Details of the 8 patients are given in a table. *Ernest Muir*

BROWNE, S. G. La gale filarienne et la lèpre. **[Filarial Itch and Leprosy]** *Ann. Soc. Belge de Méd. Trop.* 1959, June 30, v. 39, No. 3, 257–65. [11 refs.]

This paper deals with the difficulties, in places where onchocerciasis and leprosy are both highly endemic, in distinguishing one from the other or a

combination of the two. In the Belgian Congo the clinical resemblances of the two diseases have not been sufficiently recognized. As an example, in a certain leprosarium one-third of supposed lepromatous patients were bacteriologically negative over a long period, till it was recognized in the end that they were not suffering from leprosy at all but from onchocerciasis. Sometimes there are patients with nodular leprosy in whom the nodules do not disappear after prolonged sulphone treatment, till it is recognized that the nodules contain adult filariae.

The author mentions an area in the equatorial forest with a population of 45,035 in which 11·88% were suffering from leprosy and 17·3% from onchocerciasis. Of the leprosy patients 72·71% were tuberculoid, 3·49% indeterminate, 20·64% lepromatous and 3·16% dimorphous. The thorough methods used in diagnosis are mentioned. Three stages in the development of onchodermatitis or *gale filarienne* are described: with papular urticaria, with itching xeroderma, and with atrophy and progressive fibrosis. In all doubtful cases it is necessary to examine smears for microfilariae and *Myco. leprae*, and sometimes to examine biopsy material histologically. The author's study is based on 131 cases and examples are given of patients in whom forms of the 2 diseases resembled each other. *Ernest Muir*

Languillon, J., Beytout, D. & Clary, J. Le traitement de la maladie de Hansen par la diphényl-thio-urée (4 butoxy - 4′ - diméthylaminothiocarbanilide). [**The Treatment of Hansen's Disease with Diphenylthiourea**] *Bull. Soc. Path. Exot.* 1959, Mar.–Apr., v. 52, No. 2, 160–65, 3 figs. on 3 pls.

Mention is made of the use of the thioureas in their activity against *Myco. tuberculosis* in 1953 [*Bull. Hyg.*, 1953, v. 28, 808]; and, in treating leprosy, of the work of Davey and Currie [this *Bulletin*, 1956, v. 53, 1435] and Ross Innes *et al.* [*ibid.*, 1957, v. 54, 1419]. The present authors used CIBA 15095E in the treatment of 20 patients (12 tuberculoid and 8 lepromatous) for periods of 10 to 14 months, giving 1 gm. twice a day in tablet form.

There was marked improvement both clinically and bacteriologically in the 8 lepromatous patients. Of those with the tuberculoid type of disease 9 made considerable improvement and 3 moderate improvement.

The authors conclude that CIBA 15095E [diphenylthiourea (4-butoxy-4′-dimethylaminothiocarbanilide)] gives results in leprosy comparable to those with DDS. There is a remarkable absence of side-effects. It should not, however, displace the use of DDS, but should be used when there is intolerance to the latter.

It was remarked in the discussion which followed that Davey had found a certain amount of drug resistance after use for 9 months. *Ernest Muir*

Languillon, J. & Clary, J. Traitement de la maladie de Hansen par la D-Cyclosérine. [**Treatment of Leprosy with D-Cycloserine**] *Méd. Trop.* Marseilles. 1959, July–Aug., v. 19, No. 4, 431–7, 6 figs.

Because of its good effects in tuberculosis the authors tried D-cycloserine in leprosy. They treated 4 patients with lepromatous and 1 with tuberculoid

leprosy. Beginning with a daily dose of 250 mgm. they increased it to 1,000 mgm., but finally decided to limit the dose to 750 mgm. After a year's treatment there was marked clinical improvement in all patients, and in the lepromatous cases there was granulation of the bacilli and marked reduction of the bacillary index, especially in nasal smears. It is concluded that D-cycloserine should be given a place in the anti-leprosy therapeutic arsenal.

Ernest Muir

Browne, S. G. Un traitement pour maux perforants rebelles. **[The Treatment of Persistent Perforating Ulcers]** *Ann. Soc. Belge de Méd. Trop.* 1959, June 30, v. 39, No. 3, 267–74.

The treatment consists of injections of 500,000 units of penicillin daily and bathing of the feet in a 1 in 1,000 solution of Chloramine T for 5 days, followed by application of 2½% aureomycin ointment to the ulcers. Weekly subcutaneous injection of chaulmoogra oil around the ulcer is a useful addition: the initial dose of 0·5 ml. is increased weekly until it reaches 2–2·5 ml. Ambulant patients should wear sandals with padding around the ulcer, and all dead tissue should be removed surgically. In 166 patients 317 ulcers were found. Cicatrization was complete in 188 ulcers, almost complete in another 81, while the others were benefited to a less degree. *Ernest Muir*

Diniz, O. Profilaxia da lepra no Brasil. Plano atual da campanha e sua execução. **[Prophylaxis of Leprosy in Brazil. The Present Plan of Campaign and its Execution]** *Bol. Serviço Nac. de Lepra.* Rio de Janeiro. 1958, Sept., v. 17, No. 3, 231–46, 1 chart.

This paper traces the progress made in the control of leprosy during the years 1946 to 1957 in 22 States of Brazil. During that period 61,976 leprosy patients have been registered, of whom 36,635 were of the lepromatous type, 13,119 indeterminate and 12,222 tuberculoid. During the period 5,377 new patients have been discovered by examination of those in contact with known patients. A table shows that the 2 States with the most cases are São Paulo with 21,005, and Minas Gerais with 11,463. Stress is laid on the importance of early diagnosis and treatment by examination of people in contact with known patients. *Ernest Muir*

Dulcetti, F. F. Superintendência do Serviço de Profilaxia da Lepra do Estado do Pará—Relatório de 1958. **[Report on the Prophylactic Leprosy Service of the State of Pará, Brazil, for 1958]** *Bol. Serviço Nac. de Lepra.* Rio de Janeiro. 1959, Mar., v. 18, No. 1, 44–70, 1 chart.

In 1957 in a population of 1,291,000 inhabitants there were 5,126 known cases of leprosy in the State of Pará, Brazil, making a prevalence of 3·97 per 1,000. During 1958 228 new cases were registered, 186 being in the capital and 42 in the interior. Of 2,873 patients under control there are 1,626 at 2 dispensaries, 1,067 at 2 leprosaria, and 180 at an educational centre.

Particulars are given of the various institutions and the methods used to treat and prevent the disease. *Ernest Muir*

Olmos Castro, N., Arcuri, P. B., Usandivaras, R. L., Conejos, M., Bonatti, A. A., Lebrón, E. J. & Toranzos, L. B. Prednisolona y fenómeno de Wade. Acción de la prednisolona en la primera parte del fenómeno de Wade. [**Prednisolone and the Phenomenon of Wade. Action of Prednisolone in the first part of the Phenomenon of Wade**] *Semana Méd.* 1959, July 16, v. 115, No. 3, 108–11.

This phenomenon consists in the fact that dogs, which have been sensitized to lepromin by a first intradermal injection, react much more rapidly and powerfully to subsequent injections of lepromin [this *Bulletin*, 1941, v. 38, 703]. The first part of the phenomenon is the reaction in dogs to the first injection of lepromin in a manner similar to that in susceptible human subjects.

In order to find out the effect of hormones on this phenomenon the authors injected 2 dogs intramuscularly with 0·10 gm. of prednisolone daily for 27 days. On the third day of these injections they injected lepromin of the Mitsuda-Hayashi type intradermally. Reaction to lepromin, which should normally have shown about the first or second week, was suppressed as long as the prednisolone injections continued; on their suspension the reaction occurred.

Second injections of lepromin, given about 8 weeks after the first, produced different results in the 2 dogs. In one there was a strong reaction within 48 hours, in the other the reaction was delayed for 14 days. *Ernest Muir*

Okada, S. **Electron Microscope Studies of the Murine Leprosy Bacillus.** *Internat. J. Leprosy.* Wash. 1958, Oct.–Dec., v. 26, No. 4, Pt. 1, 352–5.

In this study in which the electron- and optical-microscopical structures were compared with each other and with the appearances produced by different staining techniques, various results were obtained but only those concerned with the problem of the diverse granules and the relation between lipids and the bacilli are reported.

Although the electron microscope sometimes revealed in untreated bacilli granules with distinct boundaries like the A-body of tubercle bacilli, most of the large granule-like structures were irregular and should therefore be regarded as dense zones. These zones are areas in which are aggregated such substances as the granules which stain with Altmann mitochondria stain, and these granules were shown to coincide with Gram-positive granules, and with granules staining with Heidenhain haematoxylin; osmophilic granules also appeared to coincide with them but they were larger. As polysaccharide was not demonstrated in any of the granules, the material staining with the polysaccharide stain cannot be regarded as real granules.

Examination of sediments collected by differential centrifugation of the products of the bacilli destroyed by repeated freezing and thawing showed granules 100–200 mμ in diameter in those collected at 11,000 r.p.m. and flat granules 50 mμ in diameter, resembling those of tubercle bacilli called "particulate partile" by Yamamura [no reference given], and numerous small spherical ones 15–20 mμ in diameter, in those collected at 38,000 r.p.m.; the supernatant fluid contained fine rod- or rosary-shaped granules. Some of the large granules contained DNA and others RNA; some were Gram-positive but others were negative (the positive reaction of the whole bacillus would appear to be due to the positive granules), and some contained fat. The smaller particles were

negative to the orcein-HCl reaction ; they appeared to contain RNA and protein but no fat. The very fine granules may be related to those composing the endoplasmic reticulum of animal cells.

The cell walls of the bacilli of ultra-thin sections were 10–20 mμ thick and of high density. Sometimes an amorphous substance of low density filled spaces between bulges of this wall and the dense cytoplasm, and these bacilli thus resembled those occasionally seen after staining with Sudan III. Whole bacilli stained with Sudan III showed an annular effect, staining with inner and outer areas, but when the bacilli were first stained with fuchsin only the outer zone stained with the fat stain. The electron-microscope revealed around the bacillus a dense zone 50–140 mμ in width ; this zone is assumed to be a lipoid.

The examination of bacilli which had been kept in media used for the cultivation of the tubercle bacillus suggests that a process of demarcation followed by fragmentation, different from ordinary cell division, occurs with murine leprosy bacilli. *S. R. M. Bushby*

HELMINTHIASIS

*In this section abstracts are arranged as far as possible in the following order:—*TREMATODES *(schistosomes, other flukes);* CESTODES *(Diphyllobothrium, Taenia, Echinococcus, other cestodes);* NEMATODES *(Hookworms, Ascaris, Filarial worms, Dracunculus, etc., Trichuris, Enterobius, Trichinella, etc.).*

LIE KIAN JOE & TAN KOK SIANG. **Human Intestinal Helminths obtained from Autopsies in Djakarta, Indonesia.** *Amer. J. Trop. Med. & Hyg.* 1959, July, v. 8, No. 4, 518–23. [19 refs.]

In a series of 664 autopsies carried out in Indonesia between 1952 and 1955 the species of helminths present were studied by removing the bowel completely, and washing the contents through 2 wire sieves with apertures of 1·5 mm. and 0·4 mm. respectively. The gut was then opened and the wall examined for attached worms. All the larger worms were collected but some smaller forms, *e.g., Heterophyes* and *Strongyloides* escaped detection.

One or more species of helminth were found in 98% of autopsies. 99% of 586 Indonesians were infected and 87% of 69 Chinese. Tables show the incidence, average worm load, and the age and racial distribution of the various helminths found. Hookworms were most common, with an 85·5% incidence and an average worm load of 60·8. Though the sexes were about equally infected males had a higher average worm load. Infection rates were high in all age-groups with a peak incidence in the 16- to 25-year age-group. *Necator americanus* was more common than *Ancylostoma duodenale* (85% and 41% with average worm loads of 58 and 7 respectively). In Indonesians the percentage of ankylostomes to necators was 5·7% but in Chinese it was 15%. *A. ceylanicum* was found 7 times and *A. caninum* once. *Trichuris trichiura* was present in 84·9% with an average worm load of 12·7. *Ascaris lumbricoides* incidence was 60·8% and the average worm load was 5·3. High incidences were found in the middle and lower socio-economic classes because of direct contact with contaminated soil and food, even though the middle-class people mostly lived in fairly sanitary surroundings. The poorer people

lived in temporary buildings without water or sanitary facilities. Though infection rates were high, average worm loads were inexplicably low. Only a few carried sufficient hookworms to cause anaemia, but the absolute number in the general population must represent an important problem. The remaining worms which have been reported from Indonesia by other workers are listed and the references given. *T. H. Davey*

Biagi F., F. & González, Clementina. Estudio de métodos para el recuento de huevos en materia fecal. **[The Examination of Faeces for Ova]** *Rev. Latinoamer. Microbiol.* 1959, Mar., v. 2, No. 1, 51–62, 4 figs. English summary.

The authors state that examination of the faeces by Ferreira's method [see this *Bulletin*, 1958, v. 55, 457] allows all the floating material of the faeces to collect in the narrow part of the funnel, so that by knowing the numbers of eggs eliminated an approximate idea of the number of helminths harboured can be obtained.

Ferreira's method is a centrifugal flotation procedure in which faeces are diluted 1:10 in water and the results are expressed either as the number of eggs per gm. of faeces or the number per gm. of the solid residue.

1,536 specimens of faeces from 122 persons were examined by several different methods, including the Stoll, Ferreira, Beaver and Mazzotti methods.

The results showed that there was a considerable variation in the number of ova found in successive counts in individual persons but that the Ferreira 1:10 method gave by far the least number of failures to detect ova. In view of this individual variation 3 specimens are probably necessary before an opinion on the number of helminths harboured can be given. The authors consider that unless controlled in this way the results of tests of anthelmintic drugs may seem to be unduly favourable. *W. K. Dunscombe*

Ainslie, J. F. **Schistosomiasis amongst Rhodesian Troops.** *J. Roy. Army Med. Corps.* 1959, July, v. 105, No. 3, 131–4.

The author stresses the need for seeking evidence of schistosomiasis in persons in endemic areas before the disease is clinically obvious, so that early treatment may be established. He illustrates this by his own experience as a regimental medical officer to a battalion of Rhodesian troops who went to Malaya in April 1956. The battalion consisted of 56 Europeans and 856 Africans. A survey carried out on three-quarters of them some 6 months earlier had revealed the presence of *Schistosoma haematobium* ova in the urine of 60 men. All were treated with Nilodin [lucanthone] by mouth, but between 2 and 16 months after arrival in Malaya it was found that 30 were again positive for ova in the urine. It is added that there had been difficulty in "getting them to take the tablets".

In addition, 31 new cases arose between 5 weeks and 20 months after arrival in Malaya. These 61 cases amounted to 7% of the force; 58 of those affected were Africans. 12 cases arose within 6 months, 19 within 12 and 30 within 20 months of departure from Rhodesia. It is clear that these men, who were believed to be at the peak of physical fitness when they left Rhodesia, had been carriers for a considerable period and could have been potential infectors had they remained in Rhodesia. No suitable snail vectors were found in

Malaya, but snails similar to those in Rhodesia were found there and, although schistosomiasis has not been transmitted by them experimentally the author suggests that if a sufficient number of ova were set free in Malaya for long enough, adaptation to local snails might take place, as has occurred in other countries.

Symptoms were vague—commonly mild dysuria was noted, but there was never marked haematuria. Diagnosis was made only by repeated urinary investigation, if necessary with cystoscopy; 50 cases were diagnosed microscopically and 11 by cystoscopy.

In treatment, sodium antimony tartrate given intravenously was found most efficacious and although the familiar unpleasant side-effects occurred there were no recurrences in 30 patients so treated. In 31 others, especially those reacting unfavourably to sodium antimony tartrate, stibophen, Nilodin and anthiomaline were tried by the intramuscular route: in these there were 10 recurrences. Urines were examined every 2 weeks for 3 months from the fourth week after discharge from hospital. The author points to the implication of an average of 21 days per man having been spent off duty.

If it is assumed that other Rhodesian battalions are similarly affected, it would appear that there is a considerable reservoir of infection in the armed forces alone in that country. In view of the highly mobile functions of these troops, the importance of this is evident from the possibilities of dissemination of ova into watercourses throughout the Central African Federation.

The author proposes that dissemination could be prevented if all members of the forces were examined regularly for the presence of ova in the urine, and all who were positive received the appropriate treatment. He adds—optimistically, but with appreciation of the practical difficulties—that if such a system were introduced in the armed forces it should be possible to extend it to cover civilian organizations as well. [This study is, however, an admirable example of what can be done with a population small enough to be under regular surveillance.] *H. J. O'D. Burke-Gaffney*

MAFFI, M. La valorizzazione delle acque del Fiume Giuba (Somalia) ed il problema sanitario della bilharziosi (schistosomiasi) vescicale. [**The Use of Water from the River Juba and the Problem of Schistosomiasis in Somalia**] *Ann. Soc. Med. Igiene Trop. Somalia.* 1954–8, v. 2, 69–74. [14 refs.]

The English summary appended to the paper is as follows:—

"The epidemiological problem of vesical bilharziasis in the zone of middle and lower Juba (Somalia) is outlined, and the necessity is stressed to take into account health problems when economic development is planned."

MAFFI, M. Le singolarità del problema della schistosomiasi in Somalia e la loro importanza nell'esecuzione di un'azione di lotta. [**Peculiarities in the Problem of Schistosomiasis in Somalia and their Importance in Control Programmes**] *Ann. Soc. Med. Igiene Trop. Somalia.* 1954–8, v. 2, 211–19. [26 refs.]

The English summary appended to the paper is as follows:—

"The author illustrates the peculiarities of urinary schistosomiasis in Somalia

and considers them in relation to a campaign against the disease, stressing the possibility of achieving ' malacism without bilharziasis '."

RIDLEY, D. S. **Schistosomal Complement-Fixation Test.** [Correspondence.] *Trans. Roy. Soc. Trop. Med. & Hyg.* 1959, May, v. 53, No. 3, 298–300.

The author comments on the observations of SCHOFIELD [this *Bulletin*, 1959, v. 56, 738] that the schistosoma complement-fixation test becomes less frequently positive with increased duration of exposure or, more probably, with repeated infection, by saying that the test was positive in 82% of all *Schistosoma mansoni* infections of less than 10 years' duration, that the figure for *S. haematobium* was higher, and that false positives do not occur with good antigens.

Satisfactory antigens may be difficult to obtain. Antigens used by the author were provided by FAIRLEY [*ibid.*, 1931, v. 28, 196], DAVEY, STANDEN and NEWSOME [for details see the original]; those made from naturally infected snail livers and cercariae contaminated with snail faeces were most satisfactory in giving high titres with schistosomal sera and negative reactions in controls.

Clean cercariae were not fruitful sources and it is suggested that the active principle of the antigens, being water-soluble, may be washed out of the cercariae by repeated washing or that some factor in the snail liver or faeces may increase its solubility in alcohol while the antigen is extracted. Snail livers infected in the laboratory are unsatisfactory, possibly because of the over-destruction of the liver by hyperinfection, or by washing in water.

W. E. Kershaw

DEUVE, Marguerite. Contribution à l'étude semeiologique des lesions uretero pyelo calicielles dans la bilharziose. [**Symptomatological Study of Upper Urinary Tract Lesions in Schistosomiasis**] *Maroc Méd.* 1959, Sept., v. 38, No. 412, 1334.

The author reports on 18 cases of urinary schistosomiasis from Rabat, away from endemic foci. Most had minimal signs and were discovered at routine examination on account of slight terminal haematuria. She was struck by the frequency of upper urinary tract lesions, since 16 patients had infection of the ureter, pelvis or calyx of the kidney. Full examinations were therefore made and these included cystoscopic and radiological studies and also intravenous urography.

There were several cases of severe renal insufficiency, with progressively increasing levels of blood urea and abnormal renal function tests.

Vesical calcifications were seen in 8 patients and, in no less than 14, lesions of the ureter were found. Dilatations of the calyx and hydronephrosis of the renal pelvis were also common. In one patient, renal tuberculosis was also present. The author regards intravenous urography as an essential routine diagnostic procedure and considers that it would be usefully employed in conjunction with other diagnostic measures in surveys of villages in endemic areas

and should throw some light on the frequency of these upper urinary tract localizations of schistosomiasis in Morocco. *H. J. O'D. Burke-Gaffney*

BUEDING, E. **Mechanisms of Action of Schistosomicidal Agents.** *J. Pharmacy & Pharmacol.* London. 1959, July, v. 11, No. 7, 385–92. [26 refs.]

This article is based on a University of London Lecture given at the London Hospital Medical School on 17th February 1959, and describes the work of the author and his colleagues on the mode of action of schistosomicidal agents. These investigations have been regularly reviewed in this *Bulletin*.

Although schistosomes live in an environment at considerable oxygen tension their existence apparently does not depend on respiratory metabolism, and they can be cultured for a period of some days anaerobically, during which time carbohydrate is utilized at a considerable rate. The chief product is lactic acid, formed by the Embden-Meyerhof-Parnas path of phosphorylating glycolysis. The rate of glycolysis is markedly lowered by trivalent antimonials.

Experimental results have indicated that antimonials inhibit the formation of hexosediphosphate from its precursor, fructose-6-phosphate, through interference with the enzyme phosphofructokinase, at lower concentration than is effective against the human enzyme. Tests were made to find whether the concentration of fructose-1-6-diphosphate formed by it affected the rate of glycolysis. It was concluded that antimonials reduce the glycolytic rate by inhibiting this enzyme so that the activity of the next enzyme in the chain—namely aldolase—is deprived of substrate. The inhibition of phosphofructokinase was demonstrated in intact worms as well as in cell-free preparations of the parasites and on analysis of results the author concludes that the schistosomicidal action of trivalent antimonials is due to inhibition of this enzyme.

Alkyldibenzylamines, which are also schistosomicidal agents, appear to exert their effect by interfering with the uptake of glucose by the worms. Treatment with trivalent antimonials in combination with alkyldibenzylamines has shown a greater effectiveness than treatment with the drugs singly because of interference with carbohydrate metabolism at two different levels.

J. D. Fulton

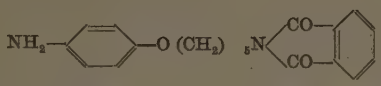
FRIEDHEIM, E. A. H., SALEM, H. H. & EL SHERIF, A. F. **Antimony Dimercaptosuccinate in Urinary Bilharziasis.** [Correspondence.] *Lancet.* 1959, Sept. 19, 410.

In a paper not yet published, Friedheim and De Jongh reported from Liberia that a single intramuscular injection of TWSb stopped the elimination of living ova of *Schistosoma haematobium* for 1–5 months. They therefore thought that an injection once each month would act as "suppressive management" of the disease.

They have now given one injection of 0·3–0·5 gm. according to weight to 50 infected persons in an endemic area in Egypt, and they found that when examined one month later 39 were not passing ova, 11 were passing dead ova, and none were passing living ova. A patient treated each month may therefore no longer be a hazard to the public health. *Charles Wilcocks*

SCHNEIDER, J. & SANSARRICQ, H. L'activité antibilharzienne du para-amino-phénoxy-1-phtalimido-5-pentane (6.171 R.P.). A propos de 43 observations de bilharziose vesicale à *Schistosoma haematobium*. [**Schistosomicidal Activity of Para-aminophenoxy-1-phthalimido-5-pentane (6.171 RP). Observations on 43 Cases of Urinary Schistosomiasis**] *Méd. Trop.* Marseilles. 1959, July–Aug., v. 19, No. 4, 412–24.

Numbers of N-*p*-aminophenoxyalkyl-amides, -imides and -sulphonamides have been under study as schistosomicidal drugs for oral use (reports still in the press). This compound, para-aminophenoxyl-1-phthalimido-5-pentane, one of the series, is labelled in Britain 2948A, M & B. Its graphic formula is as follows:—



The authors have treated with this drug 43 African children and adolescents (8 to 20 years old) with *Schistosoma haematobium* infections in French West Africa. None of them suffered from the grosser manifestations of vesical schistosomiasis. Careful repeated examinations were made of the urines taken after exercise before treatment and weekly 2 or 3 weeks thereafter, usually for 3 months. The patients were kept in hospital throughout the treatment and subsequent period of observation to prevent parasitic reinfection. The gross dosage employed ranged from 6 gm. (12 tablets) to 29 gm. (58 tablets), over periods of one week or of 10 days. The patients' weights ranged from 17 to 62 kgm., and the intensity of the treatment from 260 to 568 mgm./kgm. of body weight.

Toxic side-effects were not grave; they took the form of nausea and vomiting and of epigastric pains, which did not vary throughout the treatment. Some enteric-coated tablets later became available; side-effects were less among the few patients given these, though the drug dosage was at the highest level.

In all cases the treatment resulted in disappearance of the minor symptoms (bladder pains and discomfort on micturition). Macroscopic haematuria stopped in 70% and microscopic haematuria in 16% of them. Viable eggs vanished from the urines of 59% of the patients, and eggs totally disappeared in 11%. The dosage scales of 500 mgm./kgm. or higher gave results superior to those below this level. The drug at these higher dosages clearly is of value in the treatment of urinary schistosomiasis; it compares favourably both in this respect and in its toxicity with the thioxanthones and the antimonials.

A. R. D. Adams

REY, L. **Molluscs of the Genus *Oncomelania*, in Brazil, and their Possible Epidemiological Significance.** *Rev. Inst. Med. Trop. São Paulo.* 1959, July–Aug., v. 1, No. 2, 144–9, 13 figs. [14 refs.]

"Molluscs of the family *Hydrobiidae* (= *Amnicolidae*), very similar to those of the genus *Oncomelania* which transmit schistosomiasis japonica in Asia, were discovered by the author in the State of Mato Grosso, Brazil, and considered by him a new species: *Oncomelania brasiliensis*. First description of shell and animal is done in this paper.

"Their natural habitats were represented by brooks with plenty of vegetation, irrigation ditches and plantations of water-cress (*Nasturtium officinale*). Most of the snails were found submerged but a few could be seen on the wet margins of the breeding places.

"The shell is very similar to that of *Oncomelania nosophora,* measuring about 5.5 millimeters in height and 2.2 millimeters in width, and showing six or seven round and smooth whorls, without axial ribs or a varix on the outer lip. This last character distinguishes this shell from that of the Eastern *Oncomelania.*

"The dark animal, like the vectors of schistosomiasis japonica, bears the characteristic 'false eyebrows' formed by coarse yellowish patches. Operculum and radula as in *Oncomelania.* Gills with 45–50 filaments.

"The molluscs are very resistant to desiccation.

"The author was unable to detect any case of schistosomiasis japonica in the region investigated, but as this is settled mostly by Japanese immigrants, who are still coming from Japan the above finding deserves the most careful attention and further study."

OETTLÉ, A. G., DE MEILLON, B. & LAZER, B. **Carcinomas of the Glandular Stomach and Hepatomas in *Rattus* (*Mastomys*) *natalensis* infected with Bilharzia mansoni.** Reprinted from *Acta Union Internat. Contre Cancer.* 1959, v. 15, No. 1, 200–202.

"Infection with Bilharzia Mansoni exercises no definite influence on the high spontaneous incidence of adenocarcinoma of the stomach in Mastomys. It however induces a great number of hepatocellular hepatomas, resembling those resulting from chemical carcinogenesis. Moreover two reticulum cell sarcomas of the intestine were found. No correlation is demonstrated with human pathology."

LUTTERMOSER, G. W. **Studies on Chemotherapy of Experimental Schistosomiasis. V. Enhancement of the Schistosomacidal Activity of Tartar Emetic and Stibophen by Glycerin.** *J. Parasitology.* 1959, June, v. 45, No. 3, 301–9. [12 refs.]

Reports in the literature have suggested that the efficacy of some drugs on schistosomiasis is increased by the use of adjuvants. The present investigation describes attempts to enhance the value of tartar emetic and stibophen by means of various chemical substances. For this purpose Swiss mice were exposed to the cercariae of *Schistosoma mansoni* and about 35 days later treatment with drugs, based on body weight, was started by the methods described [this *Bulletin*, 1955, v. 52, 177; 1956, v. 53, 615]. Groups of 5 to 30 or more mice were used for each dosage regimen, depending on how crucial the test was, and other animals besides mice were used to determine toxicities.

Three weeks after the treatment of infected mice ended, their livers and portal systems were examined and the number of dead worms noted. When drug and adjuvant were more effective than drug alone the number of live worms remaining was determined by perfusion, as well as the number of dead forms. The efficacies of different treatments could thus be compared.

Of the compounds tested only glycerol enhanced drug activity, namely in the case of tartar emetic given orally and stibophen given intraperitoneally. The reason for this enhanced activity by glycerol is discussed. *J. D. Fulton*

CHENG, Chao-Ling *et al.* **Schistosomal Hypophyseal Dwarfism. Study of 72 cases.** *Chinese Med. J.* Peking. 1959, July, v. 79, No. 1, 26–31, 1 fig.

This is a further record from China of dwarfism due to Far Eastern schistosomiasis, with details of the clinical, endocrinological, and X-ray findings. The patients (5 female and 67 male) ranged in age from 10 to 28 years, most being about 18 years. In all but one of them the thyroid function (judged by the basal metabolic rate) was active, but adrenal cortical function was impaired. There was impairment of gonad function, with sexual immaturity; the carbohydrate metabolism was deranged; X-ray examinations showed subcalcification of bone and other changes already described by previous Chinese workers. The pituitary activity governs bone growth, gonad development, and the activity of the thyroid and of the adrenal cortex, and also carbohydrate metabolism. The authors consider schistosomal dwarfism to be due to a selective hypopituitarism.

[See this *Bulletin*, 1957, v. 54, 1329; and 1959, v. 56, 181.]

A. R. D. Adams

T'ANG, Sheng-Ts'ai & CH'EN, Jih-Hsin. **3-Day Tartar Emetic Treatment of Schistosomiasis japonica in Children.** *Chinese Med. J.* Peking. 1959, Aug., v. 79, No. 2, 124–9, 1 fig.

Children treated with tartar emetic [? the potassium salt] at the conventional dosage scale for a *Schistosoma japonicum* infection more commonly have positive stools after treatment than do adults. The conventional dosage for a 20-day course for adults is 25 mgm./kgm. of body weight; 25–30 mgm./kgm. has been stated to be the safest practicable and effective dose for children [this *Bulletin*, 1958, v. 55, 1027]. The conventional dosage for a 3-day course for adults is 12 mgm./kgm.

The authors have treated 388 village children aged 3–12 years with 13 mgm./kgm. (153) or 14 mgm./kgm. (109) over 3 days without serious complications but with improvement in the parasitological cure rate. The lower of these 2 dosages resulted in an overall post-treatment positive stool rate of 44·4%, and the higher dosage 36·7%. These figures are based on 3 successive sedimentation hatching tests, done at 3 and at 5 months after treatment. The side-effects observed and their incidence are described, and they are set out in a table; the tolerance of the children to the drug on the whole was good.

It is suggested that dosage for the 3-day treatment of children with early chronic schistosomiasis might with benefit be increased to 15 mgm./kgm., if they can be kept under close watch. *A. R. D. Adams*

YAMAGUCHI, T. **Studies on *Gnathostoma* in Shikoku.** *Tokushima J. Exper. Med.* 1959, Feb., v. 5, No. 4, 326–34, 18 figs. on 7 pls. & 1 text fig. [28 refs.]

Three species of gnathostomes—*Gnathostoma nipponicum, G. doloresi* and *G. spinigerum*—are found in Japan, but only the last-named species is known

to parasitize man. During the period 1953–1958 the author and his colleagues, while working on the Island of Shikoku, studied the life cycles, hosts and morphology of these three species, and the present paper summarizes the results [many of which have already been published (see this *Bulletin*, 1957, v. 54, 734)] of their investigations. Among other observations, it was noted that *G. spinigerum* appeared to be confined to the eastern part of the island, where it was the cause of many cases of human gnathostomiasis.

R. M. Gordon

UOZUMI, K. **[An Experimental Study of X-Rays Therapy for Gnathostomiasis]** *Igaku Kenkyu*. Fukuoka. 1959, July, v. 29, No. 7, 2050–70, 5 charts. [119 refs.] [In Japanese.]

The English summary appended to the paper is as follows:—

"Gnathostomiasis has been described by many research workers as to its typical symptom, the intermittent and migrating cutaneous swelling; the cases in which the causal agent was extirpated have exceeded a dozen in number, and a later increase in the number of species to which its intermediate hosts belong, inclusive of the *Ophicephalus argus*, is increasing the danger of infection. However, no satisfactory cure for the disease has yet been worked out, the only radical treatment being extirpation of the causal organism at the right time.

"The author examined experimentally the resistance to x-rays of the 3rd stage larvae of *Gnathostoma spinigerum*, with a view to working out on x-rays therapy for gnathostomiasis. The larvae found parasitic in the fish and rats were x-ray irradiated in and out of their hosts bodies, and the effect produced in their viability, infectivity and maturation was observed.

"(1) Effect on viability: The irradiation in vitro cut short the average duration of life in the larvae parasitic in the above-named fish in a dose of 30,000r or more, and cut it short to 11.1 days (one-third of what it was in controls) in a dose of 100,000r, and that in the larvae parasitic in rats was affected in a dose of 20,000r, and cut short to 10.3 days (one-third of what it was in controls) in a dose of 50,000r.

"(2) Effect on infectivity: The infectivity of the larvae parasitic in the fish was reduced to 29·8% in a dose of 30,000r and to 9·9% in 50,000r (that of controls: 79·0%) by x-ray irradiations in vitro; that of the larvae parasitic in rats was reduced to 20·0% in a dose of 30,000r and to nothing in 50,000r (that of controls: 57·5%).

"(3) X-ray irradiations were a trifle less effective on the larvae in fishes than on those in rats.

"(4) X-rays applied in a dose harmless to the human body failed to kill the larvae in vivo.

"(5) The larvae irradiated out of their hosts went on maturing without disturbance when the rays were applied in a dose not large enough to affect their infectivity.

"(6) Large-dose irradiation produced some histological change in the esophagus, intestine and cervical glands of the larvae, but not in any other part of its body.

"To conclude: X-ray irradiation can hardly be expected to serve as a cure for human gnathostomiasis, because the larval form of the causal organism is

deprived of its viability and infectivity only when the X-rays were applied to it in large doses."

VAJRASTHIRA, S., HARINASUTA, C. & MAIPHOOM, C. **Study on Helminthic Infections in Thailand. 2. The Incidence of Paragonimiasis in the First Recognized Endemic Area.** *Japanese J. Exper. Med.* 1959, June, v. 29, No. 3, 159–66, 5 figs.

Although paragonimiasis was reported from Thailand in 1928, it was looked upon as a rare disease until 1957 when the authors of the present paper, stimulated by finding the infection in 3 persons from the same vicinity, undertook a survey of the Nong Mu District of the Saraburi Province, which lies some 90 kilometres north of Bangkok. During the survey a total of 3,000 persons were observed to have symptoms of chest trouble, and 140 of such patients suffered from acute or chronic cough. All of the latter patients had their sputum examined with the result that *Paragonimus* eggs were detected in 38 persons, *i.e.* in 27·1% of the suspects or 1·3% of the total population. All of the 38 positive patients lived in houses on or close to one of the 8 small streams which run through the area and, as the eating of raw shrimps and crabs is a common practice, there seems little doubt as to the source of the infection. On the other hand the exact species of snails and crustacea involved are not known, and the authors imply that this will be a subject for their further investigation.

[This paper makes an important contribution to our knowledge of helminthiasis in Thailand and since it contains much information not indicated in the above abstract, it should be read in the original by those interested.]

R. M. Gordon

KENDALL, S. B. & PARFITT, J. W. **Studies on the Susceptibility of some Species of *Lymnaea* to Infection with *Fasciola gigantica* and *F. hepatica*.** *Ann. Trop. Med. & Parasit.* 1959, June, v. 53, No. 2, 220–27, 2 figs. [10 refs.]

It has long been known that different strains of the same species of mollusc vary greatly as regards their susceptibility to infection by the miracidia of a particular species of schistosome and, also, that the same species and strain of mollusc may vary in its susceptibility to infection by different strains of the same species of schistosome.

The authors of the present paper show, apparently for the first time, that a similar state of affairs exists between certain species of *Fasciola* and their molluscan hosts (*Lymnaea* spp.). It appears that miracidia derived from *F. gigantica* obtained from Pakistan " are capable of infecting snails both from their own geographical area and from East and West Africa. By contrast, South African flukes, while highly infective for snails from East and West Africa, are apparently not capable of infecting the Pakistan snails ".

The authors point out that these statements require modification, in that young snails are generally susceptible to infection regardless of the origin of the miracidia. In addition, abnormal hosts may sometimes be infected even when adult and such infections, although they apparently terminate much sooner than in the normal host, may result in the emergence of mature cercariae.

Finally, the authors produce some evidence that different strains of *Lymnaea auricularia* behave differently in their susceptibility to infection by miracidia of *F. gigantica* obtained from Pakistan (their own geographical area).

[This useful paper contains much information not included in the abstract, and should be read in the original by those interested.] *R. M. Gordon*

IZYOUMOVA, N. A. **[On Parasitic Diseases of Fish dangerous to Man in the Area of Barrage Reservoirs]** *Wiadomości Parazytologiczne*. Warsaw. 1959, v. 5, Nos. 4/5, 445–51. [In Russian.] English summary.

Within the last 15 years *Opisthorchis felineus* and *Diphyllobothrium latum* have spread considerably in the Soviet Union and their larvae have been found in fish in many rivers, including the Volga. Special attention has been paid to infection of fish in barrage reservoirs and of inhabitants of the area and the author now reports a study of infection of fish with larvae of these helminths in the Rybinsk, Gorky and Kouybyshev barrage reservoirs of the Volga river.

In the Rybinsk reservoir (dammed in 1941–1942) *D. latum* infection was present in 2·1% to 70·3% of various species of fish, the highest being in pike. 8% of the neighbouring inhabitants were also infected. Metacercariae of *O. felineus* were not found, because their intermediate host was absent.

In the Gorky reservoir (dammed in 1955) larvae of both species were found. In the first few years *D. latum* infection of fish increased while *O. felineus* decreased: it seems that the snail hosts appear much later in a new area than the fish. As the fauna stabilizes, an increase in both species of worms may be expected.

In the Kouybyshev area *Opisthorchis* infection is well known in cats and has been found in man. Infection of fish from the Volga river with *O. felineus* and *D. latum* has been found previously and the author confirmed the presence of metacercariae of flukes in fish in this area a year before the Kouybyshev reservoir was dammed in 1956. He assumes that these helminths will now appear in the reservoir itself. He believes that conditions for the development of snails and zooplankton are more favourable in barrage reservoirs than in rivers. As the development of the reservoirs leads to human settlement along the banks, the possibility of human infection is increased and constant surveillance by health workers and biologists becomes necessary, so that it may be controlled. *H. J. O'D. Burke-Gaffney*

KAIPAINEN, W. J. & OHELA, K. **Effect of Tapeworm Extract on Vitamin B_{12} bound to Gastric Juice.** *Ann. Med. Intern. Fenniae*. Helsinki. 1959, v. 48, No. 2, 77–80.

"It has been found that tapeworm extract contains substances which are capable of breaking up the nondialyzable radioactive vitamin B_{12}-gastric juice complex and make one part of the radioactive vitamin B_{12} dialyzable. This may mean that tapeworm is capable along an enzymatic route of breaking up the vitamin B_{12}-intrinsic factor complex and thus of decreasing the possibility of absorption of vitamin B_{12} from the gastrointestinal tract and, consequently, of promoting the origination of pernicious tapeworm anemia."

[See this *Bulletin*, 1957, v. 54, 1333.]

JOPLING, W. H. & WOODRUFF, A. W. **Treatment of Tapeworm Infections in Man.** *Brit. Med. J.* 1959, Sept. 26, 542–4.

The authors observe that little information is available as to the relative merits of different anthelmintic regimes under standard conditions. At the Hospital for Tropical Diseases in London 5 different regimes have been used under standard conditions in the past 8 years, during which 240 patients with tapeworm infections (all but 2 were *T. saginata*) have been treated. Two criteria of success are recognized, namely (a) the expulsion of the worm complete with scolex, or (b) the failure of segments to reappear in the stools within 4 months of treatment.

Analysis of the results obtained in this large series of patients showed an overall cure rate of 79%, and established the fact that each of the regimes was equally successful though some were to be preferred on account of ease of administration and lesser tendency to induce vomiting. The authors quote two papers bearing on the efficiency of dichlorophen (2:2′-dihydroxy-5:5′-dichlorodiphenylmethane) which report the best results yet obtained with this drug: the cure rates were stated to have been 68·5% and 69·4% [this *Bulletin*, 1957, v. 54, 983] respectively. These results are clearly inferior to those which may be expected from the methods described, the essential points of which are set out below.

An initial period of preparation occupying 2 days is imposed, during which a purely fluid diet, excluding milk, is given, and a saline purge sufficient to ensure a liquid motion is taken each morning. The vermifuge is given early on the third morning, the patient having fasted from the previous evening. A saline purge is given 30 minutes after completion of administration of the drug.

1. Male fern may be given in 2 forms, with or without the addition of 14 ml. of glycerin. An emulsion is prepared of 8 ml. of extract of male fern, 8 gm. of acacia gum and 42 ml. of cinnamon water. The dose of male fern is reduced to 6 ml. for small adults weighing less than 60 kgm., and proportionately less is given to children. The total dose is given in 3 equal portions at 15-minute intervals; for children its taste may be disguised by Ribena.

2. Male fern may be given through a Rehfuss tube passed to 65 cm., the location of its tip in the duodenum being confirmed 2–3 hours after its insertion by the alkaline reaction of fluid obtained by aspiration and by the absence of dye on aspiration immediately after the swallowing of a small quantity of weak gentian violet solution. The dose of male fern may be administered through the tube either in its undiluted form or emulsified with glycerin as above. The viscosity of the crude extract demands that 15 ml. be injected into the tube to ensure the delivery of 8 ml. into the duodenum; it is not possible to wash into the duodenum with water the residuum of an 8 ml. dose which would adhere to the walls of the tube. The tube is withdrawn after administration of the drug.

3. Oral mepacrine is given as a solution of 1 gm. in 42 ml. of water, which is swallowed slowly over a period of 1 hour. This method is, however, liable to induce vomiting with consequent failure.

4. Mepacrine is given by duodenal tube in similar dosage; in this case the tube is retained *in situ* until the saline purge has been given through it.

5. Oral mepacrine and male fern. In this case, 0·3 gm. of mepacrine in 20 ml. of water is swallowed on the evening of the 2nd day of preparation

and on the following morning; 3 hours later a full dose of male fern is given as described above.

Subsequent stools are passed into a bedpan containing a little water. When male fern is used the tapeworm is usually expelled in fragments, but in the case of mepacrine treatment the worm is passed whole and stained bright yellow. Even among those patients who are proved by follow-up examination to have shed their tapeworm, in only 60% will the head be found in stools passed soon after treatment.

The administration of extract of male fern in glycerin capsules is to be deprecated since these may resist solution, especially when stale and hard, and may fail to liberate the drug proximal to the scolex of the worm, which will then survive.

Details of the regimes and results are tabulated. *J. H. Walters*

HURLY, M. G. D. **A Method of estimating Hookworm Loads.** *Ann. Trop. Med. & Parasit.* 1959, June, v. 53, No. 2, 228–34, 2 figs. [15 refs.]

"There are several reliable methods of estimating the density of helminth ova in faeces, but it is generally recognized that correlation of egg counts with the number of infesting helminths is inexact and difficult." Thus (a) the egg output may be influenced by such factors as the size of the worm load itself, which is said to vary inversely with the egg count, the age of the worms, the administration of anthelmintics, and the state of health of the host, (b) egg counts only indicate the number of female worms present, and the proportion of males to females varies in the individual persons, (c) the egg count ". . . is merely an expression of the density of ova in a given stool, and the density depends mainly on the quantity of water in the stool. Thus a patient receiving purgatives or suffering from enteritis would have a much lower egg count than a constipated patient, although the total number of ova excreted and the number of worms in each might be identical". It was to overcome this last, the main difficulty, that the author devised the technique described in the present paper, of which the following is the summary.

"1. A method of estimating hookwork loads is described, which depends basically upon the total number of ova excreted daily by the host. This number is more constant than the egg count, which fluctuates considerably; it is obtained by multiplying the egg count by the weight of the daily stools.

"2. The number of female worms present in the host is obtained by dividing the total number of ova excreted daily by the number of ova produced daily by one female worm.

"3. In the four cases investigated it would appear that each female *Necator americanus* produced approximately 6,600 ova per diem, with slight variations from case to case. Egg production was inversely related to the size of the worm load.

"4. The number of male worms present cannot be estimated by any known means. In the cases investigated female worms outnumbered males by two to one. It is probably best to express worm loads in terms of females only.

"5. The accuracy of the method is proportional to the number of daily estimations made. The mean of two or three may suffice for clinical purposes, but the mean of seven or more estimations should be taken when accuracy is essential.

"6. A method of recovering hookworms from stools is described. After washing in a sieve, the worms are floated on a solution of magnesium or zinc sulphate. The method is clean and time-saving."

[It appears to the abstracter that the author of this paper has devised a more satisfactory method for estimating the "hookworm load" than any previously described. The original should be consulted for details of the technique used.] *R. M. Gordon*

See also p. 65, FIELD *et al.*, **Haemoglobin Levels and Helminthiasis in Malay Recruits.**

BLANK, H., WINTER, Mary W. & BECK, J. W. **The Effects of Chemical and Physical Agents on Filariform Larvae of** *Ancylostoma braziliense*. *Amer. J. Trop. Med. & Hyg.* 1959, July, v. 8, No. 4, 401–4. [22 refs.]

183 compounds were tested *in vitro* against the filariform larvae of *Ancylostoma braziliense*. "Among the organic phosphates, Co-ral (0,0-diethyl 0-(3-chloro-4-methyl-7 coumarinyl) phosphorothioate) and malathion had activity which might be of practical value in the treatment of human infections and for application to contaminated soil. Dilan among the chlorinated hydrocarbons, chlorpromazine among the phenothiazines and Vapam among the nematocides showed similar activity." [The authors imply, although they do not state, that the larvae of *A. braziliense* are the predominant, if not the only cause of the ". . . distressing skin lesions of creeping eruption . . .". An examination of the literature shows that, in naturally occurring infections, the species of nematode has seldom been identified, and that in the majority of instances it has been open to question whether the causal organism was the larval form of a round worm, a fluke or an arthropod.] *R. M. Gordon*

BRANCACCIO, G. & VINGIANI, A. Sulla diffusione delle parassitosi intestinali nei bambini del Comune di Agerola. Gravità del problema. **[Incidence of Intestinal Parasites in Children in Agerola, Naples, and its Importance]** *Acta Med. Italica.* 1958, Sept., v. 13, No. 9, 250–52. [21 refs.]

Examination of stools of 136 children in Agerola, Naples, in 4 age-groups between 1 and 12 years, revealed the presence of intestinal parasites in 107, the percentages varying from 40% to 100% with increase in age. Most of the parasites were *Ascaris lumbricoides*, which increased from 40% at age 1–2 years to 67% at the higher ages. In some 15% of cases, this worm was associated with *Enterobius* or *Trichuris*. *Giardia* was found in 8 children, 6 of them aged 6 to 12 years.

The authors point to the seriousness of these infections on the children's health and development, but add that measures for hygienic improvement of the area are being taken in hand. *H. J. O'D. Burke-Gaffney*

SAYED, B. A., SHAH, S. & ACHARYA, P. T. **Intestinal Obstruction and Death due to** *Ascaris lumbricoides*. *Indian J. Child Health.* 1959, Sept., v. 8, No. 9, 501–3, 1 fig.

A case in Baroda. See this *Bulletin*, 1956, v. 53, 222.

CHAUDHURI, R. N. & SAHA, T. K. **Tropical Eosinophilia: Experiments with *Toxocara canis*.** *Lancet.* 1959, Oct. 3, 493–4. [11 refs.]

In order to test the hypothesis that tropical eosinophilia and related conditions may be due to the presence of larvae of nematodes for which man is not the natural host [this *Bulletin*, 1957, v. 54, 489, 1471; 1958, v. 55, 1356] the authors, from the Calcutta School of Tropical Medicine, studied experimental infections with *Toxocara canis* in 2 lots of 24 guineapigs and in one volunteer.

In the first study, guineapigs with eosinophilia not exceeding 3% were given 1 ml. of a suspension of 1,000 to 1,400 embryonated eggs of *T. canis* intragastrically. Within 2 weeks the blood eosinophilia increased considerably, reaching a maximum of 30–55% in the third week and falling to 10–20% about the sixth week. In 4 animals examined by X-rays, 3 showed mottling in the lung fields: 3 animals were killed and reddish patches were seen on the lungs and whitish granules on the liver. Microscopically, accumulations of eosinophils were seen around the bronchi, as exudates in the bronchioles and the alveoli, and as a diffuse infiltration of the interalveolar spaces. Segments of larvae were found. There were numerous granulomatous areas in the liver, often with remnants of larvae in the centre and many eosinophils at the periphery.

In the second study the animals were fed with 450–500 embryonated eggs of *T. canis* daily for 14 days. A similar eosinophilia (up to 51%) was found but it lasted for 8 weeks or more. Comparable lung changes were found. 5 of the animals showed evidence of respiratory distress.

The volunteer was given a saline suspension of 100 embryonated eggs of *T. canis*. His leucocyte count initially was 6,700 per cmm. (335 eosinophils per cmm.) and the relative eosinophilia was 5%. On the 13th day after the feed the eosinophil count increased to 26% (2,704 per cmm.). On the 30th day the leucocyte count was 21,800 per cmm. (13,516 eosinophils) and the relative eosinophilia was 62%: it remained at 40–50% thereafter, with an absolute count between 5,000 and 8,000 per cmm. 4½ months after the eggs had been ingested, the leucocyte count was 12,800 per cmm. and the relative eosinophilia 48%. The patient developed an irritant nocturnal cough and the manifestations in general simulated those of tropical eosinophilia.

H. J. O'D. Burke-Gaffney

NAGATY, H. F., RIFAAT, M. A. & MORSY, T. A. **Trials of the Effect on Dog *Ascaris* in vivo produced by the Latex of *Ficus carica* and *Papaya carica* growing in Cairo Gardens.** *Ann. Trop. Med. & Parasit.* 1959, June, v. 53, No. 2, 215–19. [19 refs.]

"1. The latex of *Papaya carica* has an ascaricidal effect in dogs at a dose of 1·3 c.cm. per kgm. From trials *in vitro* it is suggested that the lowest effective dose against *Ascaris* may be only one tenth of this dosage.

"2. The lowest dose of the latex of *Ficus carica* to eliminate dog *Ascaris* is 1·8 c.cm. per kgm. A dose of 1·3 c.cm. per kgm. appears to kill most of the *Ascaris* worms and may have a depressive effect on the egg production of the remainder. At the doses used, *F. carica* latex has no effect on dog cestodes."

Dobbin, J. E., Jr., Coelho, M. V. & Cruz, A. E. Filariose no Território de Fernando de Noronha. **[Filariasis in Fernando Noronha Island, Brazil]** *Rev. Brasileira Malariologia.* Rio de Janeiro. 1958, Apr., v. 10, No. 2, 133–6.

The English summary appended to the paper is as follows:—

"An epidemiological survey was made in Fernando de Noronha, in November 1957, in order to evaluate the prevalence of bancroftiasis, malaria, Chagas' disease and leishmaniasis. This survey consisted of a) blood examination of the human population for filariasis and malaria and b) capture of the intermediate hosts of the above mentioned diseases.

"Eight hundred and nine persons were examined (78·7% of the population of the island) and one per cent of this group presented embryos of *Wuchereria bancrofti.*

"The houses inhabited by infected people, were searched for mosquitoes and 15% of *Culex pipiens fatigans* were infected.

"All positive cases were recorded from people who had lived a long time in an endemic area (Recife).

"Only *Culex pipiens fatigans* and *Aëdes* (*0*) *taeniorrhynchus* were recorded. Not a single case of malaria, Chagas' disease and leishmaniasis was registered, as well as their intermediate hosts."

Rachou, R. G., Mello, A. L. & Ferraz, D. M. Resultado de um inquérito de filariose humana em Pôrto Alegre (Rio Grande do Sul) realizado em 1953–1955. **[Survey of Human Filariasis in Pôrto Alegre, Brazil, in 1953–1955]** *Rev. Brasileira Malariologia.* Rio de Janeiro. 1958, Apr., v. 10, No. 2, 207–10.

The English summary appended to the paper is as follows:—

"The authors present the results of a bancroftiasis survey in Pôrto Alegre (Rio Grande do Sul—Brazil), where they examined the blood of 18,811 persons (20 cmm: 19:00—23:00 P.M.) and dissected 12,490 specimens of *Culex pipiens fatigans* captured indoors. The survey showed 27 carriers of microfilariae (0·14%) and 6 infected specimens of *C. p. fatigans* with first stage larvae. The great majority of carriers have been surely infected in Pôrto Alegre, the most southern focus of this filariasis in the world (30° 01′ 55″ S). Temperature and humidity (annual means: 19.3° C and 77%) are the limiting factors of local transmission. During the current year captures and dissection of mosquitoes are being done, in an attempt to find infective specimens of *C. p. fatigans.*"

Fraga de Azevedo, J., Gândara, A. F. & Ferreira, A. P. Contribuição para o estudo da filariase na Província de Timor. **[Filariasis in Timor]** *Anais Inst. Med. Trop.* Lisbon. 1958, Mar., v. 15, No. 1, 235–43, 1 fig. English summary.

This paper, along with many others published in the same journal, deals with one aspect of the results of an investigation into many aspects of life on the island of Timor, which, although partly belonging to Portugal, forms part of the Indonesian archipelago.

The population of the area is nearly 440,000 (1950 census) and examinations for filariasis were made in many areas.

In 29 areas, 3,350 persons were examined for diurnal microfilariae, in 2 examinations were also made for nocturnal microfilariae, while in 3 the incidence of elephantiasis was also investigated.

To all intents and purposes *Wuchereria malayi* was the only filarial worm found, though the authors do not dismiss completely the possibility of a non-periodic *W. bancrofti* also. The incidence of diurnal microfilariae varied from 5·9% to as low as 0·2% and patients with elephantiasis showed a greater percentage positive than did those apparently healthy. 83% of the lesions of elephantiasis were on the lower limbs.

The Knott concentration method is recommended for the detection of microfilariae in the blood. *W. K. Dunscombe*

SYMES, C. B. **Observations on the Natural History of Human Filariasis in Fiji. A Report to the Secretary of State for the Colonies on Investigations conducted over the Period 1954–1956.** 126 mimeographed pp., 2 folding maps. [1959.]

Geographical and climatic conditions in the Fiji group of islands are briefly presented with the aid of maps and tables giving meteorological data, and over 50 other tables detail the results of mosquito dissections, microfilarial counts, etc. The numbers of population and modes of employment are also given.

House catching showed that *Culex fatigans* and *C. annulirostris* were the commonest species. *Aëdes fijiensis* occurred in 18 of the 22 areas studied but was in appreciable numbers only in 4. Mosquito catching in the bush showed that *Aëdes pseudoscutellaris* and *Aëdes polynesiensis* were predominantly bush mosquitoes and, with the reservation that the two species are difficult to differentiate, it seemed that *Aëdes pseudoscutellaris* occurred in both coastal and inland areas while *Aëdes polynesiensis* was confined to the coastal belt or its vicinity; there did not seem to be any concentration of the two species in the vicinity of villages. The bionomics of the foregoing and other species are discussed for various localities in the region under study. Microfilariae were found in 3 species of mammal and 2 species of bird examined out of a total of 18 species. The dog filaria, *Dirofilaria immitis*, was found capable of developing in *Aëdes pseudoscutellaris*, *Aëdes fijiensis*, *C. fatigans*, *C. annulirostris*, *Aëdes aegypti* and *Aëdes vexans*; the filaria of the fruit bat [*Pleuropus hawaiiensis*] developed only in *Aëdes pseudoscutellaris*, *Aëdes polynesiensis* and *Aëdes fijiensis*.

Mosquitoes caught in houses and in the bush, at distances of 25, 50 and 400 yards from a village, were dissected. With reservations, the figures suggest that, in Fiji, *Aëdes fijiensis*, *Aëdes pseudoscutellaris* and *Aëdes polynesiensis* are about equally efficient as vectors of the Pacific form of *Wuchereria bancrofti*, while *C. fatigans* has a low potential in this respect. Experimental infection of a number of vectors with *W. bancrofti* was carried out and over 75% of *Aëdes fijiensis*, *Aëdes polynesiensis* and *Aëdes pseudoscutellaris* produced third and mature stages of the worm. *C. fatigans* destroyed an appreciable proportion of larvae taken up but 45% tolerated development to third stage or maturity. In work on the infection potential of subjects with low microfilarial counts infection of *Aëdes pseudoscutellaris* occurred in cases where no microfilariae were demonstrated in 20 cmm. blood samples.

In other experiments on infected mosquitoes high microfilarial counts in the infecting blood were associated with increased mosquito mortality and in the higher microfilarial levels the highest death rates occurred in the first 24 hours after infection. It was also found that with *Aëdes pseudoscutellaris* about half of the ingested microfilariae are lost in the first 24 hours.

In the studies on human filariasis it was noted that probably significant differences existed between microfilarial counts obtained in various regions; thus the incidence in Taveuni was 25·2% and 24·7% in Savusavu, as compared with 17·8% in Viti Levu and 6·4% in Labasa. It was also found that the intensity of infection was higher in the Taveuni and Savusavu samples. Microfilarial counts from some donors were found to have a peak in the course of the afternoon and evening; 12 out of 20 showed this in one series.

Control measures hitherto in use in Fiji involve cutting grass and bush within a 100-yard radius of habitations to reduce local mosquito density. There is no evidence, however, that these measures have had any influence on the incidence of filariasis. It is suggested that this may be due to the fact that exposure to vectors may occur to an appreciable extent elsewhere than near houses, and also that these measures are not effective against the house-frequenting *Aëdes fijiensis* and *C. fatigans*. It is conceded, however, that there is need for further data on transmission rates at different distances from villages.

Difficulty in maintaining mosquito control measures for any length of time appeared to stem from the fact that "There is apparently no urge, in any community in Fiji, to control mosquitos".

A mosquito control experiment carried out by spraying the houses in 4 villages showed a good residual effect with a 5% dilution of DDT wettable powder (50%) and a 2½% dilution of dieldrin wettable powder (50%) but a poor result with a 5% dilution of BHC wettable powder (6·5% gamma), in which much of the effect was lost in 2 months. These results are discussed with reference to the prevailing experimental difficulties and such factors as the effect of reed and bamboo building materials used in Fiji.

The effect of diethylcarbamazine, in doses ranging from 50 to 450 mgm. daily, on microfilariae was studied in 39 subjects by means of different schemes of administration. Reduction of microfilarial counts was found with nearly all methods but in a number of cases microfilariae reappeared or failed to clear with treatment.

The report concludes with suggestions for further research. *E. R. Nye*

DUKE, B. O. L. **Studies on the Biting Habits of *Chrysops*. VI. A Comparison of the Biting Habits, Monthly Biting Densities and Infection Rates of *C. silacea* and *C. dimidiata* (Bombe Form) in the Rain-Forest at Kumba, Southern Cameroons, U.U.K.A.** *Ann. Trop. Med. & Parasit.* 1959, June, v. 53, No. 2, 203–14, 4 figs.

In the Cameroons, man-biting *Chrysops* are *C. silacea* and *C. dimidiata* (Bombe form). The author can differentiate the adults morphologically but recognizes imperceptible transitions from typical *C. dimidiata* to the Bombe form. On the other hand, Mr. H. OLDROYD of the British Museum (Natural History) (personal communication, 1957) considers, on morphological grounds, that *C. dimidiata* (Bombe form) should be incorporated with the species

C. silacea. This taxonomic issue is not here discussed, but further field work is reported on the habits of *C. silacea* and *C. dimidiata* (Bombe form) in the rain forest at Kumba.

Previously [this *Bulletin*, 1958, v. 55, 924] *C. silacea* was shown to reach its morning peak of biting 1 hour earlier and fall from its afternoon peak 1 hour later than *C. dimidiata* (Bombe form). It is now reported that both these species bite more intensely in the presence of a wood fire. The Bombe form is more efficient in finding hosts (human bait) on the forest floor. Biting activity by *C. dimidiata* (Bombe form) shows one peak from November to January, a second from March to May; biting is nearly zero from June to October. Notably different is the single long season of *C. silacea* from April to December. The overall peak of infective biting (for *Loa loa*) is April to June, this conclusion being derived from data combined for the two species. These data take into account for each month, for 27 months, the number of infective flies caught per 10 boy-days and the total number of infective larvae in these *Chrysops* (about 1,000, 700 and 370 larvae in May–June of 3 successive seasons, when peak catches of infective flies were about 10 or more flies for the 10 boy-days). In no month were infective flies absent; February is the month of least infectivity.

There is evidence from infectivity data, but for *C. silacea* only, that the morning peak contains a preponderance of nulliparous flies. This is now under investigation by a study of corpora lutea [follicular relics].

Emphasis is given to the need for comparative data on biting habits and infectivity to be properly related to season and hour of day, certainly for loiasis if not other filarioid infections. *D. S. Bertram*

STALLYBRASS, F. C. **A Concentration Method for the Rapid Demonstration of Microfilariae in Peripheral Blood.** [Correspondence.] *Lancet*. 1959, Sept. 19, 415.

The method employed is fully described. Essentially, it consists in mixing 5 ml. of venous blood with an anti-coagulant (sequestrene, or Heller and Paul's mixture, is recommended), after which the supernatant plasma is pipetted off and centrifuged. Samples of the resultant deposit are then spread in the form of thick films, dried and stained with Leishman. *R. M. Gordon*

BIAGI F., F., RUIZ REYES, F., TAY, J. & PORTILLA, J. *Simulium gonzalezi* como posible transmisor de la oncocercosis. [*Simulium gonzalezi* **as a Possible Vector of Onchocerciasis**] Reprinted from *Medicina*. Mexico. 1958, Apr. 25, v. 38, No. 794, 169–71, 2 figs.

The English summary appended to the paper is as follows:—

"Serial histological sections were made of 53 specimens of *Simulium gonzalezi* [*S. exiguum*], collected in a locality with high endemicity of human onchocerciasis, *S. gonzalezi* was 91·7% of the black flies collected.

"Microfilariae was found in 34% of *S. gonzalezi*. This species may be responsible for the transmission of onchocerciasis." [See also this *Bulletin*, 1950, v. 47, 557; 1953, v. 50, 235.]

De Moura, L. S. Lesões oculares em doentes de oncocercose nas zonas de Catabola e Camacupa (Planalto do Bié, Angola). **[Ocular Lesions in Patients with Onchocerciasis in Catabola and Camacupa, Angola]** *Anais Inst. Med. Trop.* Lisbon. 1958, June, v. 15, No. 2, 451–7.

The English summary appended to the paper is as follows:—

"This is the first report on ocular onchocerciasis in Angola (Portuguese West Africa). In the middle of this country (highland of Bié), the examination of 24 patients was made, all of them with strong clinical evidence of ocular conditions attributable to this disease. The general infestation was proved, in all cases, by the microscopical detection of the parasite in skin snips.

"In these 24 patients the blindness was found in 29 eyes.

"The most common and important lesion, for the diagnosis and for the functional state, was the choreo-retinopathy (18 eyes). Certainly this will be the case in some more eyes in which the examination was troubled by the presence of opacity in the anterior segment.

"The optic nerve atrophy, variable in degree but always sure, was detected in 13 eyes. The neuro-retinal oedema was never present.

"The characteristic lesions of the limbus and of the iris were found in some cases but the 'pumice stone' iris and the punctate keratitis have not been detected in any case."

DEFICIENCY DISEASES

De Meira, M. T. V. & De Sousa, H. T. Contribuição para o conhecimento do estado de nutrição da população de Cabo Verde. V—Inquérito alimentar em meios rurais da Ilha de S. Vicente. **[Nutrition in Cape Verde Islands; Dietary Survey in Rural Areas of S. Vincent]** *Anais Inst. Med. Trop.* Lisbon. 1958, June, v. 15, No. 2, 383–96, 1 map & 18 figs. on 9 pls. English summary.

Ecoma, E. E. **Observations on the Growth of Children in Nsukka Division, Eastern Nigeria.** *J. Trop. Pediatrics.* London. 1959, Sept., v. 5, No. 2, 59–63, 2 figs.

"The results of a cross-sectional study of the heights and weights of 446 infants in Nsukka Division of Eastern Nigeria have been reviewed in this paper. The average birth weight for the Nsukka series is 6 lb. 4 oz. with a variation of ± 16 oz. for 70 per cent. of the series. This figure is below the U.K. standard of 7 lb. and above the Indian figure of 6 lb. 1 oz. The gain in weight over the second six months of life is only one-third of the gain during the first six months, this is 3 lb. and 9 lb. respectively. The U.K. figures are 5½ lb. and 10 lb. respectively. Lack of adequate protein supplementary feeds and a high incidence of malarial infection have been suggested as reasons for this much reduced gain in weights during the second six months of life."

PHILLIPS, P. G. & LADELL, W. S. S. **Nitrogen Balance in Nigerians.** *J. Trop. Med. & Hyg.* 1959, Aug., v. 62, No. 8, 181–94, 3 figs. [43 refs.]

Nitrogen balance studies were carried out on adult male Nigerians when subsisting on diets composed mainly of cassava flour or a cassava product, *gari*, but supplemented with a soup made from vegetables and dried fish. Nitrogenous equilibrium was established with an intake of 44 gm. protein per day, most of which was provided by the fish.

The digestibility of both cassava products was high. *R. Passmore*

LIPPARONI, E. Il kwashiorkor nella zona del Medio Uebi Scebeli. **[Kwashiorkor in Central Uebi Scebeli, Somalia]** *Ann. Soc. Med. Igiene Trop. Somalia.* 1954–8, v. 2, 51–68. [21 refs.]

The English summary appended to the paper is as follows:—

"The author gives a brief account of the notions gathered by the experts of the W.H.O. and the F.A.O. in several African regions on the problems aroused by kwashiorkor. The pathological causes of this syndrome are not well known. In Somalia, where the alimentary diet of the population is normally rich in proteins (especially milk proteins) the problem connected with the weaning of babies does not exist; only in exceptional circumstances, such as scarcity of food, the author has found among the children of the rural areas, where he is working, cases of the kwashiorkor syndrome. These cases, though limited in number, are not to be overlooked.

"The author gives the clinical picture of the disease, as he had the opportunity to observe it, and he discusses some dubious features of the syndrome as depigmentation and dermatosis. He believes that kwashiorkor might be considered as non-existent among the populations of the Medium Uebi Scebeli as long as alimentary conditions are normal; but, as soon as food scarcity sets in for a longer period, the disease might spread among the children of rural areas."

REIFF, B. & SCHNIEDEN, H. **Plasma Copper and Iron Levels and Plasma Paraphenylene Diamine Oxidase Activity (Plasma Copper Oxidase Activity) in Kwashiorkor.** *Blood.* 1959, Aug., v. 14, No. 8, 967–71. [31 refs.]

This paper from Ibadan, Nigeria, confirms the finding of LAHEY *et al.* [this *Bulletin*, 1959, v. 56, 205] in Central America that in children with kwashiorkor the levels of serum copper and iron are low. This may be attributed either to a deficient intake from diets based on cassava or to malabsorption or to excessive excretion associated with the diarrhoea. *R. Passmore*

VINCENT, M. & RADERMECKER, Marie A. **Histologic Investigation of Muscle Tissue in Kwashiorkor.** *Amer. J. Trop. Med. & Hyg.* 1959, July, v. 8, No. 4, 511–17, 5 figs. [13 refs.]

This paper gives a histological description of muscle in kwashiorkor and is based on examination of material obtained by biopsy from African children

in Ruanda-Urundi. Excellent photomicrographs show oedema of the intermyal spaces with infiltration of lymphocytes and fibroblasts. In advanced cases a fine network of connective tissue fibres may be laid down. The muscle fibres are only involved when the oedema and fibrous changes are advanced, but then there may be fragmentation and reabsorption of isolated fibres.

[See also this *Bulletin*, 1957, v. 54, 743.] *R. Passmore*

Truswell, A. S., Hansen, J. D. L., Schendel, H. E. & Brock, J. F., with the technical assistance of S. E. Truswell. **Controlled Trial of the Protein Value of a Maize/Pea Vegetable Mixture for Pre-School Children.** *South African J. Lab. & Clin. Med.* 1959, June, v. 5, No. 2, 63–78, 4 figs. [21 refs.]

This paper records the comparison of two flours as a staple food for children aged 1½ to 6 years living in an orphanage in Cape Town. One flour was made from a mixture of 2 parts maize meal and 1 part pea flour (*Pisum sativum*). The other was made from 2 parts of maize meal and 0·7 part of spray-dried skimmed milk. In addition to porridge made from these flours, the children received each day one helping of a vegetable and one of fruit. In each of two trials, the children on the maize/pea mixture did not grow as well as the others and this difference was enhanced during an epidemic of chickenpox when these children on the maize/pea mixture lost weight. It is concluded that a maize/pea mixture has less nutritional value than a maize/milk mixture, though it may be adequate as a sole source of protein in healthy children with good appetites [see also this *Bulletin*, 1958, v. 55, 1269]. *R. Passmore*

HAEMATOLOGY

Digilio, V. Interesse clinico del protidoplasma nella patologia tropicale. (Sintesi con contributo personale.) [**Clinical Significance of Plasma Proteins in Tropical Diseases**] *Acta Med. Italica.* 1958, Dec., v. 13, No. 12, 315–30, 7 figs. [300 refs.]

A general review with notes on some personal cases.

Tedeschi, G. Su taluni aspetti etiopatogenetici delle anemie nei paesi caldi. [**Some Aetiological and Pathological Aspects of Anaemia in the Tropics**] *Acta Med. Italica.* 1958, Sept., v. 13, No. 9, 235–49. [Numerous refs.]

A general review and discussion.

Field, T. E., Scheuer, P. J. & Tribe, C. R. **Haemoglobin Levels and Helminthiasis in Malay Recruits.** *J. Roy. Army Med. Corps.* 1959, July, v. 105, No. 3, 113–19, 1 fig. [12 refs.]

Of 143 Malay recruits, none were malarious, and 111 showed hookworm eggs in a single stool specimen. Hb levels were carefully estimated, and in 43 cases fell below 10·4 gm. per 100 ml. No treatment of any sort was given,

and the recruits underwent 13 weeks of training, taking a liberal (3,300 calorie) diet, with animal protein daily. Hb levels were then measured again by the same method.

Although a slight fall of Hb concentration occurred in 20 recruits, the average had risen from 11·3 to 12·9 gm./100 ml. Improvement had been most noticeable in those with low initial values, so that now in only 2 subjects the Hb fell below the 10·4 gm. level. There was no detectable difference in response between those with and those without eggs in the initial stool. The changes are ascribed to the good diet. *Alan B. Raper*

VELLA, F. **Susceptibility to Drug-Induced Haemolysis in Singapore.** *Med. J. Malaya.* 1959, June, v. 13, No. 4, 298–308. [38 refs.]

"1. The incidence of glucose-6-phosphate dehydrogenase deficiency in the erythrocytes of healthy adult blood donors was 2·50 per cent in Chinese and 4·76 per cent in Indians in Singapore.
"2. In Chinese new-born infants, the incidence of enzyme deficiency was 2·63 per cent.
"3. No enzyme deficiency was found in two cases of Haemoglobin H—Thalassaemia, four of Haemoglobin E—Thalassaemia, twelve of Haemoglobin E—trait, one of Haemoglobin L—trait and eight of Thalassaemia minor. The enzyme was deficient in one patient with Haemoglobin H—Thalassaemia and in one child with a 'fast' variant of foetal haemoglobin in his blood.
"4. Amongst eighteen hospital patients under 1 year in age, suffering from anaemia—haemolytic in the majority—two, a Chinese and a Jew, had enzyme deficiency.
"5. Amongst eighteen hospital patients over 1 year of age, two, a Chinese and a Jew, had enzyme deficiency.
"6. The incidence of glucose-6-phosphate dehydrogenase deficiency in the Chinese, Indian and Jewish communities of Singapore is significant. The possibility of drug-induced haemolysis should be considered in patients with haemolytic anaemia or jaundice."

KRAUS, Lorraine M., MORRISON, D. B. & KRAUS, A. P. **Abnormal Human Hemoglobins. I. Biosynthesis *in Vitro* of Fe59-Labeled Human Hemoglobin A and Hemoglobin S.** *Blood.* 1959. Oct., v. 14, No. 10, 1103–11, 4 figs. [10 refs.]

"The synthesis of Fe^{59} labeled-hemoglobin during incubation of bone marrow from normal and sickle cell anemia (crisis and non-crisis) patients has been investigated. The in vitro synthesis of hemoglobin S in the steady state (non-crisis) sickle cell anemia individual was found to proceed at a much faster rate than the synthesis of hemoglobin A from normal individuals. In the crisis of sickle cell anemia, the uptake of Fe^{59} and synthesis of hemoglobin S were approximately at the same level as synthesis of hemoglobin A from the normal individual. The results of this study indicate that one of the mechanisms involved in sickle cell anemia crisis is a decrease in synthesis of hemoglobin S as compared to the synthesis of hemoglobin S during the steady state of noncrisis."

DIAMOND, Margaret P. **Five Cases of Sickle-Cell Haemoglobin-C Disease.** *Lancet.* 1959, Sept. 12, 322–4, 1 fig.

"Five cases of sickle-cell haemoglobin-C disease, seen in the East End of London, are described, and the diagnostic features discussed. The diagnosis can be made on clinical grounds with the aid of simple haematological techniques. One should consider the haemoglobinopathies in any coloured person with anaemia or with vague symptoms, notably joint pains.

"As sickle-cell haemoglobin-C disease is a particular hazard in pregnancy, routine examination of a blood-film for target cells in all pregnant coloured patients is recommended."

[4 patients were Jamaicans and 1 a Nigerian.]

VELLA, F. & RAMAN, P. S. **Search for Abnormal Haemoglobins at the Johore Bahru General Hospital. Three Cases of Presumed Haemoglobin E Disease.** *Proc. Alumni Ass., Malaya.* 1959, June, v. 12, No. 2, 97–100.

A survey of blood samples received in the hospital laboratory in Johore Bahru, Malaya, brought to light the following Hb variants:—

(i) In 651 Malay subjects, 41 examples of Hb AE, 3 of Hb E only, and 1 of Hb E—thalassaemia;

(ii) In 913 Chinese subjects, 4 examples of Hb AE, and 1 of Hb AJ;

(iii) In 320 Indians, 3 examples of Hb AD.

The 3 subjects with Hb E only were presumed to be homozygous for the E gene; Hb F was not increased; all subjects showed increased osmotic resistance of the erythrocytes, and only 1 of the 3 was slightly anaemic.

Alan B. Raper

DHERTE, Paulette, VANDEPITTE, J., AGER, J. A. M. & LEHMANN, H. **Stanleyville I and II. Two New Variants of Adult Haemoglobin.** *Brit. Med. J.* 1959, Aug. 29, 282–4, 5 figs.

Carriers of the Hb D trait have been identified at Stanleyville, but 2 other distinct new Hb variants, in some respects resembling Hb D, have been found and are described in detail in this paper.

"Stanleyville I" occurred with Hb A in the blood of a Nilotic woman and in 1 of her 5 children. At *p*H 8·6 on paper its electrophoretic mobility was that of Hb's L and P (*i.e.* slightly greater than that of Hb D), but at *p*H 6·0 on resin it separated clearly from these variants and assumed the position of Hb D.

"Stanleyville II" was found in 2 unrelated women, and in one child of each. It was indistinguishable from Hb's S and D on paper electrophoresis at *p*H 8·6, but on resin chromatography at *p*H 6·0 it moved between Hb S and Hb L. In its naturally occurring 40% mixture with Hb A, the solubility of the reduced haemoglobin was rather low (1·1 gm./litre in 2·58 M phosphate buffer). The subjects carrying this variant showed no sickling, no Hb F, and no haematological abnormality. *Alan B. Raper*

SCHNEIDER, Rose G. & HAGGARD, Mary E. **A New Haemoglobin Variant in an American Negro.** *Brit. Med. J.* 1959, Aug. 29, 285, 3 figs.

The blood of a male Negro in Texas was found to contain, together with Hb A, a new variant of haemoglobin with the mobility of Hb L and P at *p*H 8·6 on paper electrophoresis, and with that of Hb S and D on resin chromatography. There was no increase of Hb F or A_2 in the sample; no relatives were available for study. This variant has been compared and found identical with that described as "Stanleyville I" [see above, p. 67].

Alan B. Raper

VENOMS AND ANTIVENENES

PARRISH, H. M. **Deaths from Bites and Stings of Venomous Animals and Insects in the United States.** *Arch. Intern. Med.* 1959, Aug., v. 104, No. 2, 198–207, 1 fig. [30 refs.]

"Mortality from bites and stings of venomous animals and insects throughout the world is a greater problem than is generally realized by most people." It has been estimated [this *Bulletin*, 1954, v. 51, 724] that 30,000 to 40,000 deaths from snakebites occur annually throughout the world and data have been presented to show that in some countries animals other than poisonous snakes may be the chief offenders, as for example in Mexico where scorpions kill more people than do snakes.

In the present paper the author records the results of a detailed and elaborate study of the 215 deaths from bites and stings of all venomous animals and insects in the United States which were reported in the period 1950–54. The method of study was by analysis of the detailed information supplied by the death certificates and also by questionnaire to physician, coroner or other official. Tables and a map set out the results of the study. The venomous creatures responsible for the 215 deaths were: Hymenoptera insects—86 deaths (bees 52, wasps 21, yellow jackets 7, hornets 5 and ants 1); poisonous snakes—71 deaths (rattlesnakes 55, cottonmouth moccasins 2, coral snakes 1 and unidentified snakes 13); spiders—39 deaths; scorpions—5 deaths; Coelenterata, unspecified—1 death; stingaree or sting ray—1 death; and unknown type—12 deaths. Other tabulated information is on race, sex and age distribution of the victims; geographical distribution and seasonal distribution. The intervals between the bite or sting and death are also recorded: in 66 instances of sting by Hymenoptera death occurred within 1 hour but only in 3 snake bites did death occur so rapidly. There is a long description of the findings with many references to the literature.

"On the basis of this study it would appear that previous estimates of the incidence of bites and stings by venomous animals and insects are far too low. Very likely, many deaths in the United States from venomous animals are attributed to other causes on death certificates."

M. E. Delafield

KEEGAN, H. L. & YOSHINO, K. *Trimeresurus elegans* **(Gray, 1849), the Sakishima Habu, a Venomous Pit Viper from the Ryukyu Islands.** *Amer. J. Trop. Med. & Hyg.* 1959, Mar., v. 8, No. 2, Pt. 1, 124–33, 7 figs.

The authors summarize the information available on the pit viper *Trimeresurus elegans*, the "Sakishima habu" of the Southern Ryukyu islands.

Trimeresurus elegans is 3 to 4 feet long. It is grey above, with black-edged brown blotches. There is a well defined black band extending from the eye to the angle of the jaw. The undersurface is yellow. The head is distinct from the neck and is covered with minute scales, many of which are keeled. Body scales are strongly keeled except those adjacent to the broad ventral scutes. The subcaudals are paired; the tail ends in a spine.

There are at present no active antivenenes for the bite which produced severe general symptoms in only 2 of the 24 cases described. One death was recorded. Local necrosis in the area of the bite was usually severe. *B. G. Maegraith*

TOXOPLASMOSIS

THIERMANN, Erica, NIEDMANN, G. & NÁQUIRA, F. **Contribution to Toxoplasma Serology. III. Toxoplasma Dye Test and Complement Fixation Test in 169 Blood Samples from Individuals with Chagas Infection.** *Biológica.* Santiago. 1958, Dec., No. 26, 51–9. [14 refs.]

"Dye tests and complement fixation tests for toxoplasmosis were performed in 169 blood samples in which Chagas antibodies had been detected previously.

"The incidence of positives in the dye test (titers 1:16 to 1:512) obtained from the 'Chagas-group', was not higher than in 131 normal blood donors of similar age. Frequency of titers over 1:64 was higher in the 'Chagas-group'.

"Prevalence of positive complement fixation tests for toxoplasmosis was considerably higher in the 'Chagas-group' than in normal sera. 80% of these positives were obtained in sera with positive dye test titers.

"Frequency of positives (both dye test and complement fixation) was low in children and high in the adult groups.

"Distribution of positive results varied in 10 groups from different localities.

"Prevalence of positives for toxoplasmosis (both dye test and complement fixation) was higher in samples from subjects in which *T. cruzi* had been detected by xenodiagnosis.

"The authors conclude that the antibodies measured in the present study by the dye test are specific toxoplasma antibodies; the titer level, however, might be influenced by immunological factors, possibly due to concomitant *T. cruzi* and *Toxoplasma gondii* infections. Different aspects concerning these problems are discussed. Similar conclusions were obtained for the positive complement fixation tests, although there may be a certain percentage of unspecific results."

[See this *Bulletin*, 1959, v. 56, 357.]

SIIM, J. C. & NISSEN, N. I. **Toxoplasmosis Acquisita Lymphonodosa in a 62-Year-Old Woman. Isolation of *Toxoplasma gondii* from Lymph Node and Muscle Biopsies.** *Acta Path. et Microb. Scandinavica.* 1958, v. 43, No. 3, 298–304.

"1. In a 62-year-old woman, suffering from febrile toxoplasmic lymphadenopathy, a strain of toxoplasma gondii was recovered in animal isolation experiments from a cervical lymph node and from a muscle biopsy from the brachial biceps.

"2. Electromyography showed a decrease in the action potential duration consistent with a myogenic involvement, and myositis was demonstrated microscopically."

DERMATOLOGY AND FUNGUS DISEASES

BRYGOO, E. R., COURDURIER, J. & MEYER, G. La chromoblastomycose à Madagascar. **[Chromoblastomycosis in Madagascar]** *Arch. Inst. Pasteur de Madagascar.* 1957, v. 26, 11–22, 1 map.

In a study of 45 cases of chromoblastomycosis seen in Madagascar since 1955, the authors note that the disease is most common in the south-east in the Antandroy ethnic group. The incidence is not related to rainfall and is greatest in rural workers who habitually walk barefoot. The lesions were multiple in 30 cases and involved more than one limb in 5. They are commonly found on the lower part of the leg and foot and are strictly in the skin or hypodermis. Diagnostic errors are common owing to variations in appearance and the finding of the fungus in the affected tissue is considered indispensable for firm diagnosis.

Of 21 cultures of the causative organism, 9 have already been studied by SEGRÉTAIN. 5 were *Phialophora pedrosoi* and 4 *Cladosporium*.

In the absence of effective medical treatment, total excision of the lesions at an early stage alone gives satisfactory results and the importance of early diagnosis is stressed. *Peter Abbott*

DERBES, V. J., FRIEDMAN, Lorraine & KRAFCHUK, J. D. **Chromoblastomycosis treated by Vibrapuncture Injection of Amphotericin B.** *Arch. Dermat.* 1959, Sept., v. 80, No. 3, 286–7, 2 figs.

"Amphotericin B introduced by vibrapuncture technique resulted in a cure of a case of chromoblastomycosis."

DA ROCHA PASSOS, M. C., Jr. & NAHAS, Layla. Tratamento da blastomicose sul-americana, de localização pulmonar, pela 6-sulfanilamido-2, 4-dimetil-pirimidina. Aspectos do diagnóstico e da evolucão clínica. **[Treatment of South American Blastomycosis of the Lungs with 6-Sulphanilamido-2, 4-dimethylpyrimidine]** Reprinted from *Hospital.* Rio de Janeiro. 1959, Feb., v. 55, No. 2, 237–63, 21 figs. & 2 charts.

The English summary appended to the paper is as follows:—

"Three cases of South American blastomycosis of the lungs have been

presented by the authors, and 1 case presenting in addition lesions of the oral, oro-pharyngeal, laryngeal and bronchial muscosa.

"The patients were treated with 6-(p-aminobenzenesulphonamido)-2:4: dimethylpyrimidine, using doses of 12 Gm on the first day, 6 Gm the second and further days and 4 to 5 Gm on final phase of the treatment, with satisfactory results.

"The patients were submitted to clinical, radiographic, planigraphic, and numerous periodical laboratorial examinations: hemogram, blood sedimentation, fixation of complement and sputum.

"According to the authors the drug acts on blood levels between 5 and 7 mg%, of which nearly 95% are unbound sulphonamide.

"According to the experience of Prof. Carlos da Silva Lacaz, even high concentrations of the drug do not present fungistatic action "in vitro" on the Sabouraud's media.

"These facts show the necessity of further studies concerning the intimate mechanism of the drug action in cases of South American blastomycosis.

"Several considerations have been made about the diagnosis and evolution of the disease."

CONVERSE, J. L. & BESEMER, A. R. **Nutrition of the Parasitic Phase of *Coccidioides immitis* in a chemically defined Liquid Medium.** *J. Bacteriology*. 1959, Aug., v. 78, No. 2, 231–9, 3 figs. [19 refs.]

"Some of the nutritional requirements for improved spherulation of *Coccidioides immitis* in a chemically defined medium have been investigated. Optimal spherule formation occurred in atmospheres containing 20 per cent oxygen. In defined medium with low total solids content, a requirement for added carbon dioxide was not demonstrated. Stimulation of spherulation resulted from the addition of (a) sodium and calcium ions, (b) sodium bicarbonate, (c) the sulfhydryl compound glutathione, (d) the fatty acids, oleic and linoleic, and (e) the action of such metabolic inhibitors as sodium fluoride, copper sulfate, sulfaguanidine, and lithium chloride. The sulfhydryl inhibitors, *p*-chloromercuribenzoate, and iodoacetate inhibited spherulation and this inhibition was reversed by the addition of glutathione. The anionic surface active compound, Tamol 'N,' was more effective in stimulating growth, spherulation, spherule rupture, and dispersal of endospores than any other surface active compound tested. A combination of Tamol 'N' and sodium fluoride resulted in practically pure suspensions of intact spherules."

[See this *Bulletin*, 1957, v. 54, 755.]

TROPICAL OPHTHALMOLOGY

DE MOURA, L. S. Tracoma em Luanda (Angola). **[Trachoma in Luanda]** *Anais Inst. Med. Trop.* Lisbon. 1958, June, v. 15, No. 2, 445–9.

The English summary appended to the paper is as follows:—

"Angola has been considered as a country where the trachoma is absent

in the negroes. In the last two years the author has found some cases, with severe clinical aspects, amongst the negro population of Luanda.

"The extension of the endemics is still unknown."

UNITED STATES DEPT. HEALTH, EDUCATION & WELFARE. Pub. Health Service Publication No. 541. **Trachoma Manual and Atlas** [THYGESON, P.]. pp. v + 42, 62 figs. (12 coloured). 1958, Jan. Washington 25, D.C.: U.S. Govt. Printing Office. [$0.55.]

The foreword states that this Manual has been prepared for use by physicians and nurses in American Indian hospitals and field health units of the Public Health Service.

On the whole its objectives have been very satisfactorily reached. There are some magnificent half plate illustrations of all the stages of trachoma and of the inclusion bodies etc. but unfortunately they are all in black and white, so that their full impact is rather lost on the reader. There are some coloured plates at the end, which are unfortunately too small and too blurred to be of real value.

Apart from this criticism this book can be strongly recommended.

First, the stages of trachoma are given, the author using MacCallan's Classification, then there is an account of the pannus of trachoma and a section on the laboratory diagnosis of trachoma and the secondary bacterial infection. Then there is a section on the differentiation of trachoma from other follicular diseases. Finally, there is a discussion on external eye diseases often associated with trachoma. The treatment of trachoma is briefly discussed.

[The recent work of COLLIER and SOWA [this *Bulletin*, 1959, v. 56, 95] on the T'Ang virus is not mentioned, which is unfortunate, as the possibilities arising out of this work are so great.] *D. P. Choyce*

LIÈVKOIEVA, E. F. Importance de la méthode d'exploration cytologique dans le trachome. **[Importance of the Cytological Study in Trachoma]** *Rev. Internat. du Trachome.* 1959, v. 36, No. 3, 261–8, 1 coloured pl.

This paper draws attention to the essential feature of the cytological reaction of the conjunctiva in trachoma. The cells are almost exclusively of the lymphocyte series and there is an intense lymphoblastic reaction in the early stages of the disease. *S. P. Bedson*

BELL, S. D., Jr., SNYDER, J. C. & MURRAY, E. S. **Immunization of Mice against Toxic Doses of Homologous Elementary Bodies of Trachoma.** *Science.* 1959, Sept. 11, v. 130, 626–7. [10 refs.]

"Death of mice occurs 2 to 8 hours after intravenous inoculation of concentrated viable elementary bodies of trachoma. Toxic death can be prevented by vaccinating the mice with concentrated suspensions of homologous strains inactivated by formalin or phenol. Judged by toxic challenges, at least two antigenically distinct types of elementary bodies of trachoma occur in Saudi Arabia and Egypt."

MISCELLANEOUS DISEASES

MARTIN, M. L'allergie et les phénomènes de sensibilisation en pathologie exotique. [**Allergy and Sensitization Phenomena in Tropical Pathology**] *Méd. Trop.* Marseilles. 1958, May–June, v. 18, No. 3, 425–38.

Allergy is the lasting memorial to an unfortunate encounter.

In a very interesting address the author reviews the production of sensitivity, the means of access of the antigen and the strength of the allergic responses. A short general account of sensitivity reactions is given and the place of allergy in tropical conditions is considered.

The latter is examined in certain skin conditions and respiratory states including asthma, and also in the early stages of primary helminth infections, especially distomatosis and schistosomiasis. In schistosomiasis the author holds that allergy prepares the ground for immunization and tends to disappear as the latter develops.

Allergy plays an important part in many other tropical conditions, including Calabar swellings (loiasis), the lymphangitis of bancroftian filariasis and onchocerciasis. It is also concerned in lepromatous reactions including erythema nodosum, and possibly in trypanosomiasis.

The possibility of auto-immunization occurring in malaria as a result of tissue injury is discussed. Therapy of allergic states, and the allergic reactions induced by therapy, are also considered. The talk ends with some good advice to students. *B. G. Maegraith*

HENCNER, Z. & TUSZKIEWICZ, Maria. Odczyn Middlebrooka i Dubosa w diagnostyce twardzieli. [**The Middlebrook-Dubos Test in the Diagnosis of Rhinoscleroma**] *Ann. Univ. Mariae Curie-Skłodowska.* Lublin. Sect. D. 1958, v. 13, 129–36. [12 refs.].

The English summary appended to the paper is as follows:—

"To evaluate the usefulness of the Middlebrook-Dubos test as a new serological method for diagnosis of Rhinoscleroma, sera of clinically sure cases of Rhinoscleroma and of suspected persons were examined.

"For preparation of the antigen the method published by F. Milgrom and Zdz. Świerczyńska was used. As controls were used antigens from *Kl. Friedländeri* and *Staph. aureus haemol.* prepared in the same way. Human erythrocytes (group 0,Rh—) were mixed with 20 parts of an antigen suspension (according to the titer) and incubated for 1 hour at 37°C, then centrifugated and twice washed in physiological saline solution. Two series of twofold dilutions of the tested serum were made and a 2% suspension of coated erythrocytes was added to one series and of non-coated erythrocytes to the second one. The time of incubation was 2 hours at 37°C and 18 hours at room temperature.

"Serum of 187 persons was examined including 52 Rhinoscleroma patients of the Otolaryngological Department, 66 of Rhinoscleroma suspected persons, 11 of WR positive cases, 4 Widal positive cases, 9 patients with streptococcal angina and 45 healthy persons.

"Table I shows the comparison of the results of the complement fixation test and the Middlebrook-Dubos test.

" Table II contains the results of haemagglutination performed with 3 antigens (*Kl. rhinoscleromae, Kl. Friedländeri* and *Staph. aureus haemol.*).

" The haemagglutination test with Rhinoscleroma seems to be more sensitive but somewhat less specific than the complement fixation test. It can be useful in the serological diagnosis of Rhinoscleroma besides the complement fixation test."

BRYGOO, E. R., BERMOND, C. & DODIN, A. Premier cas malgache de rhinosporidiose. [**First Case of Rhinosporidiosis in Madagascar**] *Bull. Soc. Path. Exot.* 1959, Mar.–Apr., v. 52, No. 2, 137–140. [15 refs.]

METZ, J. & KRAMER, S. **Idiopathic Thrombocytopenia in the Bantu: with special reference to Onyalai.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1958, Sept., v. 52, No. 5, 411–13.

Onyalai is a local Bantu word used to denote a syndrome comprising acute thrombocytopenic purpura with haemorrhagic bullae in the mouth, occurring not uncommonly in people of this race.

The authors state that they have seen similar submucosal bullae in secondary thrombocytopenia in Bantu patients, in whom it was associated with marrow depression, erythraemic myelosis (Di Gigliemo's disease), megaloblastic anaemia and chronic (as opposed to acute) idiopathic thrombocytopenia. In fact, during a 2-year period in which 24 cases conforming clinically with the onyalai syndrome were investigated, only in 17 (71%) was the thrombocytopenia idiopathic and acute. Records of 3 additional patients were found in whom mouth bullae were associated with forms of thrombocytopenia which were other than " idiopathic " and " acute ".

The authors consider that the Bantu has a special tendency to develop submucosal haemorrhagic bullae in the mouth under conditions of thrombocytopenia due to any cause ; they therefore plead that this dramatic and purely descriptive name, which carries no specific or aetiological significance, should be dropped. By its use, important primary diseases such as marrow hypoplasia, leukaemia, drug intoxication and lupus erythematosus may be ignored.

A further important observation is that oral haemorrhagic bullae may be seen in haemorrhagic states in which there is no reduction in the platelets [this *Bulletin*, 1950, v. 47, 495 ; 1953, v. 50, 1164], while the literature contains accounts of typical onyalai in patients of other races, among whom examples of its association with secondary thrombocytopenia could be found [*ibid.*, 1944, v. 41, 970].

Idiopathic thrombocytopenia in the Bantu differs in some respects from the same condition as seen in the European (it is more often acute than chronic, attacks a different age-group, runs a shorter course and has a greater tendency towards mouth bullae).

[The abstracter agrees that the term onyalai has no specific meaning and should be dropped, and wonders whether a subclinical state of vitamin C deficiency may explain the racial tendency of the Bantu to develop oral bullae in the presence of a precipitating factor such as thrombocytopenia.]

J. H. Walters

Pyörälä, K., Seppälä, T., & Punsar, S. **Effect of Corticoids, Adrenocorticotrophic Hormone, Thyroxine, and Thyrotrophic Hormone on Aortic Lesions in Experimental Lathyrism.** *Acta Path. et Microb. Scandinavica.* 1959, v. 45, No. 1, 37–48, 4 figs. [55 refs.]

Vella, F. & Phoon Wai-on. **Haemolytic Jaundice in a Drug-Sensitive Patient in Singapore.** *Med. J. Malaya.* 1959, June, v. 13, No. 4, 309–12. [13 refs.]

"The case of a Jewish female patient who developed haemolytic jaundice after simultaneous ingestion of sulphamethoxypyridazine and 'pyridium' and injection of Penicillin and who was found to have erythrocytes deficient in glucose-6-phosphate dehydrogenase activity is reported."

Baylet, R. J. & Camain, R. Étude hématologique et contexte histopathologique hépato-splénique des splénomégalies de l'Africain. [**Haematological Studies and Histopathological Features of the Liver and Spleen in "Tropical Splenomegaly" in Africans**] *Bull. Soc. Path. Exot.* 1959, Mar.–Apr., v. 52, No. 2, 223–40.

The authors attempt to delineate the haematological and histopathological features in 26 patients in Dakar who were considered to show a non-specific "tropical splenomegaly".

Anaemia was constant, usually normocytic and orthochromic, without signs of active regeneration, yet with an actively erythroblastic marrow in which, however, there was some delay in maturation at the polychromatic normoblast stage. Leucocytes and platelets were diminished in the peripheral blood, and their precursors in the marrow. Splenectomy produced no fundamental change in this pancytopenia, apart from a transient rise in leucocytes and platelets. No evidence of antibodies directed against erythrocytes could be found. Liver biopsy showed a wide variety of changes, up to frank cirrhosis; the 3 spleens examined histologically showed hypertrophy of lymphoid and reticular elements. All the features associated with tropical splenomegaly pointed to prolonged over-stimulation of the lymphoid-reticular system.

Nothing is added to existing clinico-pathological knowledge but a consideration of the aetiological factors leads to the admirably brief conclusion that only the success of preventive medicine will abolish tropical splenomegalies.

Alan B. Raper

Raper, A. B. **Fibrotic Nodules of the Spleen.** *J. Path. & Bact.* 1959, July, v. 78, No. 1, 1–16, 14 figs. (12 on 5 pls.) [24 refs.]

"Benign and symptomless fibrotic nodules of the splenic pulp are found in about 5 per cent. of routine necropsies on adult Africans in Uganda. In structure they appear to be identical with nodules described as occurring very rarely in Caucasoid populations.

"Their structure is interpreted as resulting from the proliferation of reticular cells in the Billroth cords of the splenic pulp, with subsequent fibrosis. The whorled character of many of these nodules results from a zonal distribution of fibrosis within the arteriolar territories in the pulp.

"Some previous views of the aetiology of these nodules are criticised, and reasons are given against regarding them as hamartomata. It is concluded that at least some of them result from trauma that does not disrupt the reticular framework of the spleen."

SHAPER, A. G. & JONES, K. W. **Serum-Cholesterol, Diet, and Coronary Heart-Disease in Africans and Asians in Uganda.** *Lancet.* 1959, Oct. 10, 534–7 [27 refs.]

"A study was made of the dietary background and serum-cholesterol levels in African and Asian males aged 12 years, 20 years, and over 40 years in Kampala, Uganda. These two racial groups differ markedly in their liability to coronary heart-disease.

"At all three ages Africans and Asians show a considerable difference in the mean level of serum-cholesterol. This corresponds to their different consumption of fat.

"The results of this survey support the view that a rise in serum-cholesterol level is not a necessary accompaniment of ageing.

"If an aetiological relationship does exist between coronary heart-disease and the serum-cholesterol concentration, a level of 170 mg. per 100 ml. is suggested as 'ideal'."

HADLOW, W. J. **Scrapie and Kuru.** [Correspondence.] *Lancet.* 1959, Sept. 5, 289–90.

The suggestion that scrapie, an endemic disease of sheep, might be a myopathy, is rejected by the author, who writes to point out certain similarities between this disease and kuru, a neuro-degenerative disease endemic in the Fore tribe of New Guinea [this *Bulletin*, 1959, v. 56, 1283].

Both are endemic in well-defined populations, since scrapie occurs only in certain flocks, and kuru is confined to a single ethnic group, the Fore tribe. Each may develop some months after separation of the individual from his native stock, and each may appear in the progeny of union of affected with previously unaffected stock. In neither case has any recognized bacterial or viral agent been isolated, toxic and nutritional features are not recognizable in either and both appear to be determined genetically. In each disease the course is relentlessly progressive, remission or recovery being very rare. Both diseases are broadly characterized by tremors, ataxia and defects in behaviour.

There are certain striking similarities in the histopathology of the central nervous system in each disease. In scrapie, a characteristic finding is the presence of single or multiple "soap-bubble" vacuoles in the cytoplasm of affected nerve cells, and similar changes have been observed in kuru. Certain non-specific neuronal degenerative changes are common to both, also intense astrocytic activity with minimal myelin degeneration. Inflammatory reactions are also unusually meagre for so extensive an "encephalitis", while the cerebrospinal fluid shows no constant or significant abnormalities in either disease.

An important discovery has been that scrapie can be transmitted to previously uninfected stock by the intracerebral or subcutaneous inoculation of

brain homogenates from affected sheep, though the manifestations of the disease may not appear for 3½ to 30 months thereafter. The nature of the transmissible pathogenic factor is so far undiscovered. The author suggests that experiments should be made to transmit kuru from man to a laboratory primate. [Since such an experiment might open the door to further investigation into the aetiology of kuru, which at present has reached an impasse, this seems a most valuable suggestion.] *J. H. Walters*

PARASITOLOGY: GENERAL

BRUMPT, E. & NEVEU-LEMAIRE, M. **Travaux pratiques de parasitologie** [Practical Parasitology].

This book was reviewed in this *Bulletin*, 1959, v. 56, 1210.

GHERMAN, I. **Elemente de epidemiologie a bolilor parazitare** [Elements of Epidemiology of Parasitic Diseases].

This book was reviewed in this *Bulletin*, 1959, v. 56, 1211.

GOLDMAN, M. & CARVER, R. K. **An Intestinal Parasite Survey on Rongelap Atoll in the Marshall Islands.** *Amer. J. Trop. Med. & Hyg.* 1959, July, v. 8, No. 4, 417–23, 8 figs.

A group of Rongelap islanders who had been contaminated by radio-active fall-out were returned to their atoll after 3 years and given a new permanent village, and a parasite survey was made. 69 contaminated and 112 non-exposed islanders were examined by means of a stool from each person, examined direct and by concentration.

Results were similar in exposed and non-exposed persons. *Entamoeba histolytica* showed an overall infection rate of 18·2% and of the small race 6·6%. Hookworm was present in 5·5%, *Trichuris trichiura* in 34·3% and *Ascaris* was, surprisingly, absent. Eosinophilia of 5% or more existed in 74 of 129 persons; more of these had *T. trichiura* infection than those without eosinophilia, but about half those with eosinophilia had no helminth infection. Both *T. trichiura* and hookworm burdens were low. *E. histolytica* was present in 4·6% of children 5 years of age or younger. *E. coli* and *Endolimax nana* were more prevalent at these ages (23% and 19% respectively) and *Giardia intestinalis* was common in those aged under 5 years and almost absent after the age of 12 years. *Trichomonas hominis* showed a 20% to 36% incidence in all age-groups, and *T. trichiura* showed a 30% incidence in those under 5 years, rising to 73% in those aged 13 to 20 years and then declining. In general among those aged over 13 years the incidence in the sexes was similar or was higher in males, except for *T. trichiura* which was nearly twice as common in females; but in those under 13 years the incidence in females was higher except for *E. coli* which was nearly twice as high in males. The absence of *Ascaris* was probably due to the salt and sandy soil. Differences in infection rate between contaminated and non-exposed people were probably not related to radiation. *T. H. Davey*

Dobbin, J. E., Jr. & Coelho, M. de V. Parasitoses intestinais na Ilha de Fernando de Noronha. [**Intestinal Parasites in Fernando Noronha Island, Brazil**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1958, Apr., v. 10, No. 2, 127–31.

The English summary appended to the paper is as follows:—

"Human population of Fernando de Noronha was surveyed in order to find out the incidence of intestinal protozoa and helminths.

"The results of the survey demonstrated the prevalence of the following protozoa: *Endamoeba histolytica* (7·5%), *E. coli* (27·5%) and *Giardia lamblia* (8·1%). The helminths found were: *Ascaris lumbricoides* (75·1%), *Trichuris trichiura* (62·5%), *Ancylostomidae* (14·5%) and *Strongyloides stercoralis* (2·2%). The feces were examined by the method of Hoffman & cols. (1934).

"The Graham's scotch-tape method (1941) revealed 7·5% of *Enterobius vermicularis* infections.

"Snail vectors of *S. mansoni* were not found in the island. Therefore there is only a slight chance that schistosomiasis can be transmitted in spite of the positive human cases recorded, all of which came from endemic areas."

ENTOMOLOGY AND INSECTICIDES: GENERAL ZOOLOGY

[Papers on the toxic effects of insecticides in man are abstracted in the *Bulletin of Hygiene* under the general heading of Occupational Hygiene and Toxicology.]

Academy of Sciences of U.S.S.R. [**Parasitological Symposium**] 1958, v. 18, 330 pp., numerous figs. [Numerous refs.] [In Russian.] English summaries. [**The Use of Ultra-Violet Light-Traps for determining the Fauna and the Ratio of Species of Mosquitoes** (Breev, K.)], pp. 219–38, 4 figs. [37 refs.] Moscow: Leningrad: Parasitological Department, Zoological Institute.

The author describes and illustrates ultra-violet light (mercury-vapour lamp) traps, fitted with aspirators, which are very suitable for studying populations of mosquitoes such as *Anopheles hyrcanus, A. maculipennis, Aëdes vexans, Aëdes caspius, Culex pipiens, C. modestus, Uranotaenia unguiculata* and *Mansonia richiardii*; an analysis of the collection provides an objective picture of the species and their proportions.

Mercury vapour lamps with dark glass filters collect no more mosquitoes than lamps without filters. An aspirator device is necessary, otherwise the numbers collected will be less—say below 100 at a time.

Mosquitoes fly to a source of U-V light in much greater numbers than their attacks on individual men. The mass flights to the light begin about an hour after the peak activity of mosquitoes in the evening.

Data are given for catches of other insects besides mosquitoes, and it is noted that traps with aspirators are more important for collecting insects which flutter round the lights (*e.g.* moths) than those which fly straight at them (*e.g.* beetles). For assessing proportions of insects with different habits, more than one type of trap is required. *J. R. Busvine*

LEBIED, B. Détermination de l'age physiologique des diptères. Nouvelle méthode basée sur la recherche des vestiges du processus de l'ovulation. **[Determination of the Physiological Age of Diptera. A New Method based on the Examination of the Vestiges of the Ovulation Process]** *Riv. di Parassit.* Rome. 1959, June, v. 20, No. 2, 91–106, 8 figs. [20 refs.]

Dr. Lebied has, since 1943, been studying in Africa the problem of determining the age of dipterous vectors of disease from changes in their ovarioles following ovipositions. Independently of the recently announced discoveries and observations of others in this field [this *Bulletin*, 1959, v. 56, 77 ; 245 ; 510] he identified the nature and recognized the value of the vestigial follicles persisting as a chain of dilatations, containing follicular cell debris, in the posterior part of an ovariole in parous females. Their existence was early observed in the course of his dissections of wild-caught *Anopheles gambiae*, *A. funestus*, *Culex tigripes*, *C. fatigans*, *Aëdes aegypti*, *Simulium damnosum*, *Culicoides* sp., *Phlebotomus* sp., *Chrysops dimidiata* and *C. silacea*. The author carried out further work with *Aëdes aegypti* and *A. gambiae*, dissecting laboratory-reared material at various intervals after successive ovulations. From this work, a general description of events in the formation of a chain of follicular vestiges is presented. It is not clear from the description how much was seen for each of these species ; but of the mosquitoes only *Aëdes aegypti* is illustrated in schematic line drawing and in photomicrographs. [The successive vestigial follicles in these figures seem considerably stouter and less discrete than is known for *A. maculipennis* and *Mansonia*.] There is also a line drawing to illustrate appearances in the multiparous, and nulliparous, *Simulium damnosum* ; again the vestiges are, comparatively, stout and not too clearly defined. Both the figures for *Aëdes aegypti* and *S. damnosum* show at once how distinctive the nulliparous ovary and ovarioles may be from those of multiparous females, partly from the obvious material of the follicular vestiges [one or more?] and the lesser compactness of the parous ovary. Photomicrographs are of *Aëdes aegypti* (nulliparous, 3-parous), *Simulium damnosum* (nulliparous, 2-parous) and *Chrysops* (5-parous). In general, the parous can be seen to differ from the nulliparous but the photographic quality hardly allows confident refinement beyond this. There is also a schematic line drawing of a dipterous ovariole. Basically in agreement with recent views, it does include some inconsistency but not, it is here thought, of very much importance to the theme as a whole.

Application of these findings showed that *S. damnosum* could live in the rains for 65 days, if uninfected ; it is simply said that the method also demonstrated " identical life-span " for *Aëdes aegypti*, *C. fatigans*, *A. gambiae*, *Chrysops dimidiata* and *C. silacea*. There is evidence also that the life-span of *S. damnosum* and the *Chrysops* vectors of loiasis is reduced by their filarioid infections. It is emphasized, in the practice of the method, that the vestigial follicles are best sought in the ovarioles nearest the posterior end of the ovary, where there is less overlap of ovarioles. Staining, after fixation [? reagent], with Grenacher's alcoholic borax carmine and with Carazzi's glychaemalum shows up the vestiges very clearly: avoids confusion from the chain of cells (nullipars, particularly) in the narrow tube [connecting stalk ; or pedicle, if a nullipar] extending posteriorly from the currently-developing follicle.

In a footnote the author briefly comments on some of the recent work on *Simulium* and *Mansonia*, which had just come to his notice. Dr. Lebied has not found, as in these works, need to dissect out ovarioles. He does not accept " corpus luteum " as a satisfactory term but refers to little sacs, or vestiges of ovulation. [" Corpus luteum " is probably now not acceptable to most workers. There is some hope that the residual distensions (= little sacs) left in the posterior tubular region of ovarioles of parous females may be universally called " dilatations ", and the term " follicular relic " restricted to the actual cell debris of follicular epithelium which may be present in such dilatations (WHO/Mal/236, 20 July 1959).]

[Although the paper lacks details in a number of ways, congratulations are due to the author not only for his independent elucidations in this currently interesting topic, but for its scope which indicates possibilities of the application of this method of age determination to a considerable range of medically important vectors. It is intriguing, too, that it seems to have been feasible with *A. gambiae*.] *D. S. Bertram*

SURTEES, G. **Functional and Morphological Adaptations of the Larval Mouthparts in the Sub-Family Culicinae (Diptera) with a Review of some Related Studies by Montschadsky.** *Proc. Roy. Entom. Soc. of London.* Ser. A. 1959, Apr. 15, v. 34, Pts. 1/3, 7–16, 5 figs.

" The larvae of the sub-family Culicinae are divided into three classes of feeders, termed filter feeders, browsers and predators ; each of these terms is defined. The filter feeders are characterised by long, fine, unserrated mouth-brushes, large maxillae and weakly chitinised mandibles. The browsers have shorter mouth-brushes, serrated distally, whilst the maxillae are smaller and the mandibles stronger. The predators have a few strong mouth-brushes, strongly chitinised mandibles and reduced maxillae. Series of species are described extending from the filter feeders to the predators.

" The work of Montschadsky (1936) is reviewed and discussed in the light of these new observations. Ground pools are discussed as the primitive larval environment and tree-hole dwelling browsers as the precursors of the present predatory species."

CORRÊA, R. R. & RAMALHO, G. R. *Culex* (*Culex*) *deanei*, nova espécie do género *Culex* Linnaeus, 1758 (Diptera, Culicidae). [*Culex* (*Culex*) *deanei*, **New Species of the Genus** *Culex* **Linnaeus, 1758 (Diptera, Culicidae)**] *Rev. Inst. Med. Trop. São Paulo.* 1959, July–Aug., v. 1, No. 2, 141–3, 7 figs. English summary (7 lines).

CERF, J. & LEBRUN, A. Note préliminaire sur l'utilisation en pulvérisation domiciliaire d'un insecticide organo-phosphoré rémanent (Baytex). [**Preliminary Note on House Spraying with a Residual Organo-Phosphorus Insecticide (Baytex)**] *Bull. World Health Organization.* Geneva. 1959, v. 20, No. 5, 1001–5.

The high tolerance or actual resistance of *Culex fatigans* to chlorinated insecticides renders its control difficult. Most organo-phosphorus insecticides

are not sufficiently persistent. However, trials of a new compound Baytex (0,0-dimethyl-0-4-(methylmercapto)3-methyl phenyl thiophosphate) are promising. Using 20% or 40% wettable powders sprayed to give 1 gm./m.^{2}, the authors obtained control for up to 6 months, in comparison with untreated houses. *J. R. Busvine*

HADDOW, A. J., GILLETT, J. D. & CORBET, P. S. **Laboratory Observations on Pupation and Emergence in the Mosquito** *Aëdes* (*Stegomyia*) *aegypti* **(Linnaeus).** *Ann. Trop. Med. & Parasit.* 1959, June, v. 53, No. 2, 123–31, 3 figs. [16 refs.]

In recent years, diel cycles in *Aëdes aegypti* (*i.e.* more or less regularly recurring periodicity or periodicities of its biological activities during the 24 hours of consecutive day and night) have been demonstrated for its oviposition (diurnal, marked afternoon peak) and biting cycle (essentially diurnal) [this *Bulletin*, 1958, v. 55, 106]. Light was apparently a controlling factor for the periodicity of oviposition [see also GILLETT *et al.*, below].

The present investigation explored whether pupation and emergence of *Aëdes aegypti* occurs by day or by night (nearly 12 hours each in Uganda), or is simply dependent on the time of original hatching within a 24-hour period. Several interesting conclusions are drawn from meticulously conducted parallel experiments in which the events of pupation and emergence were recorded with hourly frequency for larvae initially hatched within 10 minutes, half during daylight (9.00 to 9.10 hours) and half during darkness (21.00 to 21.10 hours). The experiments embraced 1,400 larvae, for each of which records were kept individually.

There was no evidence of a diel rhythm. Pupation occurred in both series at closely comparable intervals after the hatching, *viz.* means of 177.97 and 179.02 hours for females, 168.08 and 171.26 hours for males. Emergence mean times from hatching were also very close: 226.66 and 226.05 hours for females and 213.55 and 216.95 for males. Pupal life in males was about 2 to 3 hours shorter than in females. The difference of only about 9 to 12 hours between male and female aquatic life is pointed out. The nature of the experimental design elicited the interesting detail that the longer the larval stage, the longer also the pupal phase. The results are treated statistically, tabulated and graphed. *D. S. Bertram*

GILLETT, J. D., CORBET, P. S. & HADDOW, A. J. **Observations on the Oviposition-Cycle of** *Aëdes* (*Stegomyia*) *aegypti* **(Linnaeus), III.** *Ann. Trop. Med. & Parasit.* 1959, June, v. 53, No. 2, 132–6, 1 fig. [10 refs.]

The diel cycle [*i.e.* the 24-hour rhythm] of oviposition in *Aëdes aegypti* can be shifted in its timing by changing the amount of light and dark to which the adults are exposed. Only 4 consecutive hours of light in 24 hours sufficed to control the timing of oviposition, although the converse was less clearly defined [this *Bulletin*, 1959, v. 56, 1285].

The present paper refines the observations to investigate how much shorter than 4 hours the light period can be and still impose control on oviposition timing. The different periods of continuous light (a " light-stretch ") used were

5, 15, 30 minutes, 1, 2 and 4 hours, the remainder of the 24 hours being darkness. With 4 hours light, oviposition starts just before the light-stretch and reaches a peak 4–8 hours afterwards. At 2 hours and 1 hour the results were rather similar. At less than an hour of light, the position of peak oviposition "drifted" and sometimes 2 peaks were obtained. As shown earlier, the extreme of complete darkness destroyed cyclical rhythm.

Some discussion is to the effect that this oviposition rhythm is endogenous, possibly inherited, but subject to influences in larval life; a hormonal mechanism is probably at play. There is some ventilation of contemplations about how far biting activity and oviposition activity are criteria of general activity. *D. S. Bertram*

McClelland, G. A. H. **Observations on the Mosquito, *Aëdes* (*Stegomyia*) *aegypti* (L.), in East Africa. I. The Biting Cycle in an Outdoor Population at Entebbe, Uganda.** *Bull. Entom. Res.* 1959, Aug., v. 50, Pt. 2, 227–35, 1 fig. [13 refs.]

Well-defined cyclical biting activity has been demonstrated for 6 species of *Aëdes* (subgenus *Stegomyia*) in Africa, but a limited amount of study of *A. aegypti* has already yielded results of some surprising variability, although biting is diurnal in general. The author made 10 24-hour catches of *A. aegypti* at Entebbe on Lake Victoria, Uganda. Most of the catch was ssp. *formosus*. The catches were made in a break in a narrow forest strip separating lake swamp from cultivated land and near accumulations of old tyres and vehicles prolific in breeding places. The usual procedures for hourly catches of mosquitoes biting 3 bait boys were adopted; records were also attempted (in daylight only) of the numbers of *A. aegypti* flying over a group of water-filled tyres as a measure of flight activity as distinct from biting activity. The total catch of *A. aegypti* alighting on bait boys was 238 females and 26 males, and almost two-thirds of this biting activity of females occurred in the 3 hours before sunset, the peak from 16.00 to 17.00 hours. There was, however, a smaller peak (7% of the total catch) 3 hours after sunrise. Only at these peaks did the males alight on the bait boys. Flight activity over the tyres revealed a maximum about 07.00 to 08.00 hours and, again, a high level between about 15.50 and 17.50 hours. Rhythmic dancing flight of several males and females (swarming) was twice observed in the afternoon peak.

In discussion, attention is drawn to the fact that the population of *A. aegypti* under study was mainly ssp. *formosus*, recently considered the "wild" form [this *Bulletin*, 1958, v. 55, 645], and that its well-defined crepuscular biting habit resembles that of the closely related forest mosquito, *Aëdes africanus*. There is also other evidence for both species of an oviposition peak, earlier than the evening biting peak, and of a smaller early morning peak of activity but not associated with preceding oviposition. It is suggested that domesticity in *A. aegypti* var. *queenslandensis* and *A. aegypti* type form may be associated with differences between them and ssp. *formosus* in the timing of their activities. These observations and the discussion go some way towards clarifying the disparities and variability in results in the past (including recently) in studies on the cyclical activity of "*Aëdes aegypti*".

The paper treats the data statistically and the text is supported by tables and charts. *D. S. Bertram*

Bol. Oficina Sanitaria Panamericana. 1959, July, v. 47, No. 1, 1–12, 3 figs. English summary. La erradicación del *Aedes aegypti* en el Brasil. Evolución y éxito de una gran campaña. [**Eradication of *Aëdes aegypti* in Brazil**].

After an introduction describing earlier stages in the campaign against *Aëdes aegypti* in Brazil, between 1931 and 1957, the paper gives the results of a survey in 1958. No recoveries of *Aëdes aegypti* were obtained in surveys covering all Brazilian states, as compared with recoveries in 1,187 out of 1,882 municipalities inspected in the opening years of the work. Eradication was carried out by means of petroleum in the first 17 years of the campaign and DDT for the succeeding 8 years. *E. R. Nye*

Prívora, M. & Vychodil, J. Terénníasanace horkými olejovými aerosoly. I. Hubení komárů. [**Field Disinfestation Measures with Hot Oil Aerosols. I. Control of Mosquitoes**] *Českoslov. Epidemiol., Mikrobiol., Imunol.* Prague. 1959, v. 8, No. 3, 208–11. English summary (8 lines).

In 1957–58 an investigation was made of the effect of treatment with hot oil aerosol in controlling mosquitoes (*Aëdes vexans*) over a piece of parkland 1 sq. km. in area in Czechoslovakia, consisting of woods, damp meadows and numerous sluggish watercourses. The aerosol was produced with a Swingfog machine and contained DDT or BHC which was distributed at the rate of 6·5 kgm. per hectare. The treatment was carried out several times in May and June, and produced a marked reduction in the mosquito population over a period of 1–3 months. *D. J. Bauer*

Fan, Tze-Teh & Shi, Teh-Chi. [**The Breeding Habits of the Common Flies in Shanghai District**] *Acta Entomologica Sinica.* 1959, Aug., v. 9, No. 4, 342–65, 5 charts & 14 figs. [40 refs.] [In Chinese.]

The English summary appended to the paper is as follows: —

"The present paper is an account of the results of a general survey of breeding places of the common flies in Shanghai District during the years 1954–1955. In this work, more than 50 spp. of flies are discovered, of which 15 species are more common. Among the 15 more common species, 7 are the most important from the hygienic point of view. They are *Chrysomyia megacephala*, *Musca domestica vicina*, *Lucilia sericata*, *Lucilia cuprina*, *Sarcophaga* spp., *Musca sorbens*, and *Muscina stabulans*. Most of them not only are closely related to man, but also have been proved as disease vectors as well as myiasis producers.

"Breeding places of flies are classified into 5 types, *viz.* (1) human feces, (2) animal excrement, (3) decomposing animal matter, (4) decaying vegetable matter and (5) garbage. Different types of material provide the breeding of different species of flies.

"In human feces, *Chrysomyia megacephala* and several species of *Sarcophaga* breed in large numbers. In animal excrement especially in the pig feces and cow dung, *Musca domestica vicina* breeds profusely. In decomposing animal matter especially the waste material from butchery, such as bones,

hairs and furs, *Lucilia sericata* is the most common fly found. The number of species of flies breeding in decaying vegetable matter is generally very small, it consists of only a small number of few species of *Sarcophaga*, *Fannia* and *Muscina*. In the garbage type of breeding material, the fly species are most complex, besides *Musca domestica vicina*, *Lucilia sericata*, *Sarcophaga* spp. many others are also found.

"The over-wintering habits of several important species of the flies have been observed and briefly reported. Majority of the more important species hibernate in the pupal or the larval stages and only *Muscina stabulans* hibernates as adult female.

"Based upon the results of studies on the breeding habits, principal methods of fly control are discussed and proposed."

MONROE, R. E. & ROBBINS, W. E. **Studies on the Mode of Action of Synergized Bayer 21/199 and its Corresponding Phosphate in the House Fly.** *J. Econom. Entom.* 1959, Aug., v. 52, No. 4, 643–7, 6 figs. [21 refs.]

"The toxicity and the *in vitro* and *in vivo* anticholinesterase activity of Bayer 21/199, more recently called Co-Ral (*0*-(3-chloro 4-methylumbelliferone) *0,0*-diethyl phosphorothioate), and its corresponding phosphate, with and without piperonyl butoxide, have been studied in the house fly (*Musca domestica* L.). Bayer 21/199 and its corresponding phosphate were isotoxic when administered topically to flies. Both compounds were approximately 2·8 times more toxic when administered jointly with piperonyl butoxide. The phosphate of 21/199 was a 435 times more potent anticholinesterase agent *in vitro*. No increase in inhibition was found with the addition of piperonyl butoxide *in vitro*, but this compound markedly synergized the anticholinesterase activity of 21/199 *in vivo*. Bayer 21/199 apparently was converted to its corresponding phosphate *in vivo* and piperonyl butoxide did not appear to be associated with its oxidative metabolism. A reversibility in cholinesterase inhibition occurred in flies treated with 21/199 with or without piperonyl butoxide."

WILSON, H. G. & LABRECQUE, G. C. **Evaluation of some Space Sprays for the Control of House Flies.** *J. Econom. Entom.* 1959, Aug., v. 52, No. 4, 704–6.

Resistance to chlorinated hydrocarbon insecticides in house-flies is beginning to affect the efficiency of aerosols used as household sprays, since they commonly contain such compounds. This paper describes tests of new organophosphorus insecticides and some synthetic pyrethrum-type compounds as aerosols for fly control. The substances tested were diazinon, Dipterex, ronnel and malathion (organo-phosphorus compounds); also allethrin, Barthrin and 3 chrysanthemumic acid derivatives. Wind tunnel tests showed that none of the compounds approached the efficiency of synergized pyrethrins in either knock-down or kill. The best (at rather high concentrations) were diazinon, Dipterex, allethrin and Barthrin.

Field trials in fly infested barns showed that none of these aerosols used daily secured more than temporary reduction in flies. *J. R. Busvine*

Cova García, P. & Sutil O., E. La propreté domestique et l'emploi des insecticides phosphorés dans la lutte contre les mouches. **[Domestic Cleanliness and the Use of Organo-Phosphorus Insecticides in the Control of Flies]** *Bull. World Health Organization.* Geneva. 1959, v. 20, No. 5, 849–59, 6 figs.

The authors have made regular measurements of the prevalence of house-flies and certain blowflies (*Sarcophagula* sp.) in several towns in Venezuela, throughout 1954, 1955 and 1956. Counts were made of flies resting on "Scudder" grills at different places and also on natural sites. Two-thirds of the house-flies, but only a few per cent. of blowflies were resting indoors. During the day, house-flies preferred to rest on refuse and in houses on floors and furniture, while the blowflies were common on excreta as well as refuse, the remainder resting mainly on shrubs. At night, the house-flies were nearly all divided between curtain cords, rods, etc., and nearby shrubs; while the blowflies were all on the shrubs.

A substantial improvement in reduction of house-flies was secured by increasing the frequency of domestic refuse collection to 3 times a week for houses and daily for large institutions. This did not affect the blowfly population which bred in excreta. *S. occidua* seemed to prefer human, and *S. canuta* animal, excreta; but the choice of *S. occidua* may have been influenced by a campaign to remove animal excreta, thus forcing it to seek human faeces.

The authors describe trials of various organo-phosphorus compounds to eliminate flies in animal shelters. These compounds gave good control of house-flies when used on treated cords, the most persistent being Muscatox, followed by Chlorthion and diazinon. Granular poison baits containing malathion or Dipterex were effective but had no lasting action. None of the insecticides successfully reduced the *Sarcophagula* populations, however, since these do not come indoors. *J. R. Busvine*

Forgash, A. J. & Hansens, E. J. **Cross Resistance in a Diazinon-Resistant Strain of *Musca domestica* (L.).** *J. Econom. Entom.* 1959, Aug., v. 52, No. 4, 733–9, 5 figs. [35 refs.]

The experiments were done with a strain of house-flies collected from a dairy barn where considerable use of diazinon had resulted in resistance. The flies were also known to have developed DDT-type resistance and it is probable that there was some resistance to the BHC-dieldrin group of insecticides which had been used in adjacent areas. This fly strain was colonized in the laboratory and repeatedly selected by exposure to diazinon for 9 successive generations. Its resistance was then measured (by topical application of acetone solution) to a range of insecticides, in comparison with a normally susceptible strain of flies.

The results showed a rise in resistance to all insecticides, but to very different levels. As regards organo-phosphorus compounds, there was considerable resistance to diazinon (×38) and rather less (×16, ×18) to parathion and ronnel. There was only slight resistance to malathion (×5) which was of the same order as resistance to allethrin, pyrethrins and Lethane 384 and might not represent true resistance. These differences in relative resistance in the case of organo-phosphorus compounds (especially the lack of correlation

with malathion) have been found by other workers and might be explained by detoxifying enzymes specific for phosphorothioates or dithioates.

At the same time, there was definite resistance to carbamate compounds, Isolan, Pyrolan and Sevin, which could conceivably be due to a hydrolytic detoxifying system with non-specific substrate requirements.

A puzzling feature of the resistance spectrum was the very high levels of resistance to DDT-type compounds (several thousandfold) and to dieldrin-type compounds (×200 to ×400). Although some resistance may have been present in the original strain it is clear that this had been enormously increased by selection with an organo-phosphorus compound. Similar results have been obtained in three other laboratories (K. R. Ascher; R. B. March *et al.*; R. Wiesmann:—unpublished papers of World Health Organization). The reverse effect does not occur when selecting with chlorinated insecticides, so that the resistance mechanisms, though linked in some way, are certainly quite distinct. *J. R. Busvine*

Dias, J. A. T. S. & De Sousa, J., Jr. Notas dipterológicas. II. Mais três novos tabanídeos (Diptera, Tabanidae) para a fauna de Moçambique. [**Notes on Diptera. II. Three New Tabanids in Mozambique**] *Anais Inst. Med. Trop.* Lisbon. 1958, June, v. 15, No. 2, 565–75, 5 figs. (3 on 2 pls.)

The English summary appended to the paper is as follows:—

"The authors describe a new species of horse-fly (*Tabanus evanescens* n. sp.) and report the finding in Mozambique of two further species (*Tabanus trianguliger* Austen, 1912, and *Philoliche* (*Buplex*) *subfascia* (Walker, 1854).

"Of these three entities, the first two were being here confused with, respectively, *T. unilineatus* Loew, 1852 (pro parte) and *T. quadrisignatus Ricardo*, 1908. This last name should, consequently, be struck from the list of Mozambique's *Tabanidae* and replaced by that of Austen's species named above.

"The total number of species belonging to this family now known to be present in territory is one hundred and twelve."

Stark, H. E. **The Siphonaptera of Utah. Their Taxonomy, Distribution, Host Relations, and Medical Importance.**

This book is reviewed on p. 31.

Adkins, T. R., Jr. & Arant, F. S. **A Technique for the Maintenance of a Laboratory Colony of *Cimex lectularis* L. on Rabbits.** *J. Econom. Entom.* 1959, Aug., v. 52, No. 4, 685–6.

"A technique is described for the production of several thousand fifth-instar bed bugs per month. The adult colony was fed on rabbits every other day on Monday, Wednesday, and Friday. Egg repository papers with attached eggs were removed before the colony was fed each Friday. Beginning with Monday of the successive week, the newly hatched bugs on the egg papers were fed every other day. After the young bed bugs had been fed four times they were added to the nymphal colony. In the nymphal colony the bugs

were held 10 days in newly added rearing chambers and then fed. After three feeding periods the bugs in the beakers were predominantly fifth-instars."

See also p. 19, LAVOIPIERRE *et al.*, **Studies on the Methods of Feeding of Blood-Sucking Arthropods. I.—The Manner in which Triatomine Bugs obtain their Blood-Meal, as observed in the Tissues of the Living Rodent, with some Remarks on the Effects of the Bite on Human Volunteers.**

KHUDADOV, G. D. **[Radioautographic Method of finding Insects and Ticks marked with Radioactive Isotopes]** *Med. Parasit. & Parasitic Dis.* Moscow. 1959, v. 28, No. 1, 60–64. [16 refs.] [In Russian.]

BLUM, M. S., PRATT, J. J., Jr. & BORNSTEIN, J. **Fluorinated Analogs of DDT as Toxicants and DDT Synergists.** *J. Econom. Entom.* 1959, Aug., v. 52, No. 4, 626–8.

"The insecticidal activities and ability to synergize DDT of 16 fluorine-containing structural analogs of DDT were determined.

"Of the 2,2-difluoro-1,1-di-*p*-halophenyl derivatives of ethane, ethanol and ethyl acetate, the *p*-bromo- and *p*-chloro- compounds were about equally toxic to susceptible house flies (*Musca domestica* L.) and the *p*-fluoro-compounds were less toxic. The ethane, ethanol, and ethyl acetate derivatives decreased in toxicity in the order given. The fluorodiphenylethenes were not significantly toxic to house flies.

"Maximum synergistic activity with DDT occurred in those derivatives containing *p*-chloro- or bromo-groups, fluoro- being inferior in all cases. Synergistic activity varied with the nature of the group attached to the alpha carbon atom in the following order: $OH > H > OCOCH_3$. The fluorodiphenylethanes were the least active *p*-halophenyl synergists. The difluorodiphenyl compounds containing no halogen substituent in the benzene ring were devoid of synergistic activity."

REPORTS AND SURVEYS

COLONIAL OFFICE. **Colonial Research 1957–1958. Colonial Medical Research Committee. Thirteenth Annual Report 1957–1958** [HIMSWORTH, H. P., Chairman] (pp. 149–206). Cmnd. 591. 347 pp. 1958, Nov. London: H.M. Stationery Office. [14s. 6d.]

The Colonial Medical Research Committee operates 64 research projects, many of them through or in conjunction with the East and West African Councils for Medical Research and the Standing Advisory Committee for Medical Research in the British Caribbean, to which it has delegated a considerable part of its authority, and the report gives a brief account of the progress of most of these studies and of a few studies made by associated workers.

Again, it is interesting to see the balance of what might be termed the old picture of tropical medicine and the new. The old picture is represented by studies on helminthiasis, malaria, relapsing fever, leprosy, and dermal leishmaniasis. Among them the work on loiasis, onchocerciasis, bancroftian and malayan filariasis, and dracontiasis continues in its now well established form, while there is increased emphasis on studies on schistosomiasis. There are interesting accounts of research on the transmission of malaria in East Africa, of its significance to the child population in the Gambia, and into the special problems of control presented by the *Kerteszia* group in Trinidad.

The newer picture of tropical medicine is represented by the very considerable emphasis which is clearly placed on virological and nutritional research, the studies of abnormal haemoglobins and the brilliantly successful standardized trials of drugs in treatment of tuberculosis. Two large laboratories connected with the Committee are exclusively concerned in virological research, those in Yaba, Lagos, and in Entebbe, and there is intensified and increasing activity in associated laboratories in Trinidad and Kuala Lumpur. The range of work covered in them includes so-called tropical diseases such as yellow fever, but much greater emphasis is clearly laid on cosmopolitan infections such as poliomyelitis and influenza. Nutritional research, much of it of a fundamental nature, is the main interest of the East African Institute for Medical Research, and of the Tropical Metabolism Research Unit in Jamaica which works in collaboration with the Government Applied Nutrition Research Unit. Additional fundamental work is carried out in the University College of West Africa at Ibadan and in the Medical Research Council laboratories. The report on studies on abnormal haemoglobins is interesting for its brief review of this rapidly advancing subject in which the Committee has shown much interest.

Most of the work here reported has been published and reviewed elsewhere and the interest of the present report lies in the general conspectus which it gives of a progressive year's work. *G. Macdonald*

RAMALHÃO, C. A actividade científica do Instituto de Medicina Tropical. **[The Scientific Activity of the Institute of Tropical Medicine, Lisbon]** *Anais Inst. Med. Trop.* Lisbon. 1958, June, v. 15, No. 2, 593–608.

CONGO BELGE. Fonds Reine Élisabeth pour l'Assistance Médicale aux Indigènes du Congo Belge. Rapport sur l'activité durant l'année 1956. **[Report on the Activities of FOREAMI during 1956]** 174 pp., numerous illustrations. [Numerous refs.] [1958.] Brussels: 14, Square de Meeûs.

The annual report of FOREAMI for 1955 coincided with the 25th anniversary of its foundation, and the opportunity was taken to review its work and policy fully [see this *Bulletin*, 1957, v. 54, 509]. 1956 was devoted to a continuation of the established programmes of the different branches. Incidence and lethality of the main endemic and epidemic diseases continued to decline steadily, except that a slight local recrudescence of trypanosomiasis had to be dealt with. Overt tuberculosis discovered on survey varied from 4·5 to 7·74 per mille, and Mantoux positives from 30 to 75%. BCG vaccination is now being given to everyone up to 20 years old, and for a time was

given without prior Mantoux testing. Although no ill effects were observed, testing is to be resumed in 1957, mainly in order to record the proportion of reactors. Injection of DDS suspension in chaulmoogra oil twice monthly has become the almost universally used treatment for leprosy. *B. B. Waddy*

CONGO BELGE. Fonds Reine Élisabeth pour l'Assistance Médicale aux Indigènes du Congo Belge. Rapport sur l'activité durant l'année 1957. **[Report on the Activities of FOREAMI during 1957]** 218 pp., illustrated. [1959.] Brussells: 14, Square de Meeûs.

The present annual report on the progress of the FOREAMI experiment follows the general lines of its predecessors [see this *Bulletin*, 1957, v. 54, 509; and above] in an even fuller and more ample manner. Matters of interest include a detailed analysis of the distribution of leprosy throughout the Congo and studies on the height and weight of Congolese infants and young children in relation to age and state of nourishment. The general health of this previously grossly backward area is now well established, the death rate is 17·6 per 1,000, the infant mortality rate 78·3 per 1,000, and the birth rate 42·7 per 1,000. The previously established programme of chemoprophylaxis against malaria in infants has been extended up to children aged 10 years and has been elaborated to some extent by a programme of DDT application. The authors, however, think that the wide extension of this type of control would be met by very great difficulties and prohibitive cost, for which reason chemoprophylaxis seems a better approach. There has been a further diminution in trypanosomiasis, of which the infection rate is now reduced to 0·15%, and only 0·037% of the population were found to be newly infected during the year. The campaign against tuberculosis has again been strengthened by the addition of 10 more mobile X-ray sets which have made possible a mass radiography programme in which 110,000 photographs were taken and 610 new cases of tuberculosis found and brought under treatment. The numerous annexes include, beside detailed statements of the work of separate sections of the organization, a special study of the epidemiology of trypanosomiasis in Kasongo-Lunda and on the aetiology of endemic goitre in the region of Tenda, where it cannot be attributed to iodine deficiency alone. *G. Macdonald*

CABO RAMON, J. Informe de las actividades realizadas por la Posta Médica Atalaya. **[Report on the Work of the Medical Post at Atalaya]** *Med. Trop.* Madrid. 1959, May–June, v. 33, Nos. 5/6, 309–61, 5 maps, 1 graph & 1 diagram.

This is a long and detailed description of a project, under missionary auspices but encouraged by official agencies, to improve the health of people who live in a remote part of Northern Peru. The author is a medical missionary. He set up a medical post in September 1955 and the paper takes the story until the end of 1957.

The first half describes the terrain and gives social and demographic data about this wild and desolate region. It is within 10 degrees latitude of the Equator and is intersected by rivers. Travel is mainly by canoe and is dangerous. The mean altitude is 270 metres. The population of the area

where he worked is 10,095 of whom 2,937 were whites or half-breeds and the rest original inhabitants. Facilities for education are being developed rapidly and there are 28 schools and 923 scholars.

First attendances at or from the medical post numbered 2,467 in 1956 and 7,388 in 1957. Some were for minor surgery, and 2,841 intramuscular or intravenous injections were given in 1957. The greatest problem is ignorance concerning sanitation, and the next intestinal parasites. The faeces of the children in 4 schools were examined microscopically: all contained *Ascaris* and 7–13% showed ankylostomiasis. Trichuriasis was common and a few showed the presence of *Strongyloides*.

Vermifuges were given; privies were built in the schools and a health education campaign started.

Pinta is common throughout the area. Penicillin caused the lesions to disappear, usually within 6 months.

Vaccination against smallpox was given to 897, and against whooping cough and diphtheria to 695 children and a few adults.

Outbreaks of measles and influenza are described. There were 5 cases of poliomyelitis. All these infections were imported: spread is normally slow which gives time for vaccination where appropriate.

Malaria is endemic in the region with epidemic spurts from time to time. Influenza heads the list of causes of death. Other diseases found included chickenpox, German measles, paratyphoid fever, tuberculosis, yaws, leishmaniasis, syphilis, leprosy, myiasis, athlete's foot and dhobie itch.

Pediculosis is universal and 5 to 10% of the population have scabies.

More money and staff are needed. In addition to the author, one nurse is employed (though her pay is in arrear), and one home visitor. *Allen Daley*

PASSAGER, P. Metlili des Chaamba (Sahara algérois). Étude historique, géographique et médicale. [**Historical, Geographic and Medical Study of Metlili, Algeria, Sahara**] *Arch. Inst. Pasteur d'Algérie.* 1958, Dec., v. 36, No. 4, 508–74, 5 text figs. & 37 figs. on 16 pls. [28 refs.]

The three great oases in the Algerian Sahara, Ouargla, El Golea and Metlili, form the points of a triangle which encompasses the country of the Chaamba people, and the present paper completes a series of accounts of these oases which cover their history, climate, physical characteristics, agriculture, the people who live in them and the diseases from which they suffer. [See this *Bulletin*, 1958, v. 55, 1182 and 1957, v. 54, 1479.]

The Metlili oasis differs little from the others except for its comparative lack of history which only starts to emerge in the 14th century. The characters and afflictions of the people are also much the same. Trachoma and ophthalmia are clearly the most significant infections. The Mantoux reaction shows the highest positive rate for the Saharan oases, rising from 18 of 41 for children aged 1–2, to 8 of 14 for those aged 11–15. Skin infections, particularly tinea, are a universal pest. Alimentary infections are common but not as frequent as might have been thought. Malaria is rare, evanescent and very unstable, perhaps transmitted by *Anopheles hispaniola*, and people have escaped the severity of the epidemics of typhus fever which have swept North Africa. There is a single record of dermal leishmaniasis which is rare in the desert regions where infections such as influenza, whooping cough and measles

constitute the main risk to health. There is, as in previous reports, an account of the prevalence of non-infectious diseases, among which particular interest attaches to the rarity of malignant neoplasms. During the last 5 years only 7 cases have been identified, 3 epitheliomas, 2 sarcomas, 1 leukaemia, and 1 indeterminate growth.

[These three accounts with their associated bibliographies constitute a unique story of desert life.] *G. Macdonald*

SANKALÉ, M. & PÈNE, P. Problème de santé publique au Sénégal. I. Quelques vérités premières. *Méd. Afrique Noire*. Dakar. 1959, June 1–15, v. 6, No. 11, 259. II. Les principaux aspects de l'environnement du Sénégalais. *Ibid.*, 261–5, 1 fig. [22 refs.] III. Études démographiques. *Ibid.*, 267–77, 1 map & 4 charts. [29 refs.] [IV] La protection de la mère, de l'enfant et de l'adolescent. *Ibid.*, June 16–30, No. 12, 287–93. [23 refs.] [V] Les problèmes sanitaires ruraux. *Ibid.*, 295–300. [16 refs.] [**Public Health Problems in Senegal. I. Some Basic Facts. II. Principal Environmental Features. III. Demographic Studies. IV. Care of Mother, Child and Adolescent. V. Rural Sanitation.**]

LEARMONTH, A. T. A. & PAL, M. N. **A Method of Plotting Two Variables (such as Mean Incidence and Variability from Year to Year) on the same Map, using Isopleths.** Reprinted from *Erdkunde*. Bonn. 1959, v. 13, No. 2, 145–50, 2 maps & 3 figs.

The authors have elaborated Learmonth's previous studies [this *Bulletin*, 1955, v. 52, 535; 1959, v. 56, 376] of the cartographic presentation of two variables on the same map, and in a way in which they could be readily appreciated visually. The method previously elaborated was referred to as the choropleth in which indices of prevalence and of variability were combined on a district basis.

The present work concerns the analysis of a finer form of the data in such a way that differences between variability and incidence in small sub-divisions of districts can be given their proper weight. The product is a map which bears a strong resemblance to that produced by the previous method—which is natural since the data are identical except for the final process of sorting—but which shows considerably more detail and without being artificially broken by the administrative boundaries of districts. The technique is a geographical one applicable to any type of variable and it is here developed in relation to the mortality from cholera, and also to annual rainfall and yield of some crops in the State of Mysore. The two variables in the case of cholera are prevalence and variability, and it is quite possible to decipher 7 epidemiological types within the State when they are mapped in this way. The types range from low endemicity to medium and high endemicity without much variability, from frequent epidemicity without much mortality to moderate and severe epidemicity with high prevalence. Each of these endemic or epidemic types can be related to some probable causative factor—the periodical celebration of a fair or a large irrigation project—which causes a high endemicity, and though a little study is needed to become familiar with the coding used, the technique is very informative. *G. Macdonald*

BOOK REVIEW

STERNBERG, Thomas H. [M.D.] & NEWCOMER, Victor D. [M.D.] [Edited by.] **Modern Dermatologic Therapy.** pp. xii + 520, illustrated. 1959. New York. Toronto: McGraw-Hill Book Co., Inc., London: McGraw-Hill Publishing Co., Ltd., McGraw-Hill House, 95 Farringdon Street, E.C.4. [77s. 6d.]

This book is not a comprehensive review of dermatological therapy. The authors have selected those subjects in which they consider that significant therapeutic changes have been made in the last few years. Its 26 chapters have been contributed by 22 authors, all dermatologists except for a microbiologist, a physician and 3 psychiatrists.

Collagen diseases, psychogenic disorders of the skin, and steroid therapy are dealt with at length. Single chapters discuss the commoner disorders such as seborrhoeic dermatitis, psoriasis, acne vulgaris, pemphigus, eczema, occupational diseases and urticaria, etc.

Of particular interest to the physician in the tropics are sections devoted to pigmentary disorders, light eruptions, miliaria, fungus infections and antibiotics other than penicillin in the treatment of syphilis. The recent introduction of griseofulvin has probably revolutionized the treatment of many fungus infections, and it is a pity that publication of this volume was just too early to include this important discovery.

This book is recommended to all those with a special interest in dermatology who are anxious to keep up with modern therapeutic progress; it is a little too specialized for the general medical reader. *H. T. H. Wilson*

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